

AMERICAN ARTISAN

SEPTEMBER 1953

90th Year

RESIDENTIAL AIR CONDITIONING • WARM AIR HEATING • SHEET METAL CONTRACTING

Cover Picture

ORIGINAL DISPLAYS,
which attract new cus-
tomers for this dealer,
are part of a program
designed to increase his
modernization business
..... page 86

THE NEW AFI air filter test
ode — a basis for filter selec-
on page 56

HOW CAN actual residential
cooling loads be measured ac-
curately, and do they usually
differ from calculated loads? ..
..... page 74

FACTS ON FURNACE sales in
the Toledo area can help deal-
ers increase business volume .
..... page 78

A "HARD TO HEAT" home is
provided with three furnaces
and zone control for complete
winter comfort page 91

Complete Contents ... page 4



THE *Air Control* ANSWER for all perimeter heating jobs

PAYS DIVIDENDS THREE WAYS!

Stop cold where it starts with a blanket of warmth! That's the job of every perimeter system... and with Air Control's **matched line** of perimeter diffusers, you can be sure of doing the job best. Coordinated engineering and field experience have produced the right diffuser for every installation, giving you three-way dividends to build your business and your profits on every installation.

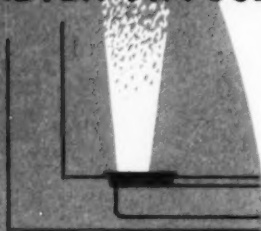
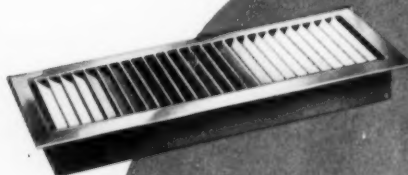
INSURE COMPLETE COVERAGE

The wider spread and higher throw that you will get with Air Control Diffusers gives you true "blanket" coverage. Each diffuser provides up to 100% **more** area coverage on cold walls, creating a curtain of warmth that protects the home from drafts and insures even comfort, everywhere.

SAVE MONEY ON EQUIPMENT

Yes, through economical production and volume sales, Air Control can provide the diffuser you need at a far lower cost than you would expect to pay. Every unit in this top-quality line is priced to save you money, hold down equipment costs and allow winning bids on any job. You not only provide better installations with Air Control... you provide them at lower cost.

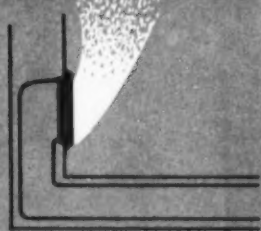
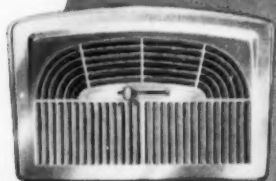
PERIMETER DIFFUSER NO. 42



FOR ANY PERIMETER FLOOR INSTALLATION

Long and narrow with heavy gauge vanes set to spray the air in a fan shaped pattern that covers cold walls and picture windows. In either 4" or 2 1/4" widths, it is efficient and inconspicuous... and it's completely adjustable from the face for easy system balancing.

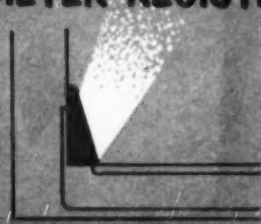
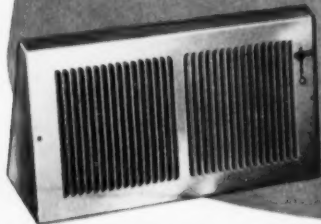
PERIMETER DIFFUSER NO. 15



FOR SIDEWALL USE... BLANKETS UP TO 14'

The exclusive fin design and flared top section combine to give you coverage that is unequalled, anywhere! The low resistance factor makes it ideal for either standard trunk designs or the new, high-velocity small pipe systems.

PERIMETER REGISTER SERIES NO. 165



FOR STREAMLINED BASEBOARD APPLICATIONS

When utmost economy and out-of-the-wall installations are to be considered, choose the No. 165 series. Install it with standard or small pipe systems, use it in old homes or homes built on slabs. You save costly cutting and achieve a clean, handsome finished installation.

PROVE AIR CONTROL SUPERIORITY FOR YOURSELF

See your local jobber or write for the Air Control catalog and price list. Prove to yourself the greater performance and economy you can provide for every job when you standardize on Air Control.

AIR CONTROL PRODUCTS, INC.



DEPT. A

COOPERSVILLE, MICHIGAN

MODERN AS TOMORROW

CENTURY'S *NEW* HORIZONTAL UNITS

**CENTURY INTRODUCES
its Latest Addition to
an Already Broad Line
Four Sizes, Oil**



A WORLD OF POTENTIAL — New and remodeled gas stations, shops, stores, etc. make up a BIG heating market. But much of this market makes a specific demand — a demand for *overhead heating installations*.

Heating contractors who can meet this special demand are getting plenty of extra business! Century's new oil-fired Horizontal Units give you what you need to go after this profitable business. Easy to install, singly or in batteries. Cost is low; operation economical.

A SECOND BIG POTENTIAL—Owners of homes without basement or utility room want central heating, too. New Century Horizontal Units were designed for such requirements. Easily installed in crawl space; front access to burner, blower and flue. Can be installed overhead in basement to save floor space.

FOUR SIZES — Bonnet output ratings of 85, 105, 135 and 160 thousand BTU. All sizes feature the famous, trouble-free Century oil burner — gives plenty of heat at LOW fuel cost. Units shipped completely assembled.

Century Engineering Corp., Cedar Rapids, Iowa

Advertised in Leading
Home Magazines

Century

— WRITE FOR DETAILS NOW —

CENTURY ENGINEERING CORP. 404 3rd St. S.E., Cedar Rapids, Iowa
Please send me details on your new oil-fired horizontal units.

Name _____
Firm _____
Address _____
City _____ State _____



SELL CENTURY — A COMPLETE LINE MEANS MORE JOBS AND PROFITS!

AMERICAN ARTISAN

SEPTEMBER 1953

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Volume 90 No. 9

**RESIDENTIAL
AIR CONDITIONING**

WARM AIR HEATING

SHEET METAL CONTRACTING

Merged with American Artisan are "Warm Air Heating" and "Furnaces and Sheet Metals"

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Quality & Performance

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OIL—GAS—COAL

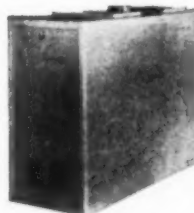
70,000 TO 1,000,000 B.T.U.s.



"700" Deluxe
Oil fired
90-146,000 B.T.U.



"500" Series
Gas or Oil
Lo-Boy



"900" Series
Oil fired
80-108,000 B.T.U.



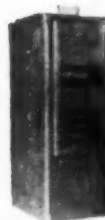
GF Gas Lo-Boy
75-145,000 B.T.U.
Input



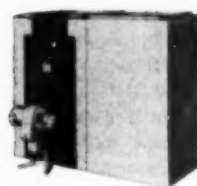
"500" Series
Oil or Gas
Hi-Boy



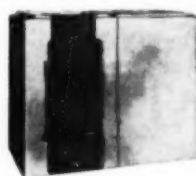
"500" Series
Gas or Oil
Counterflow



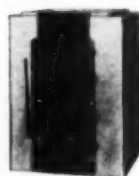
GFU Gas Hi-Boy
75-95,000 B.T.U.
Input



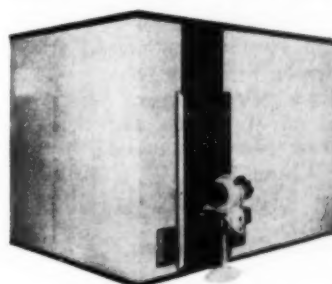
"200" Series
Oil fired
90-250,000 B.T.U.



"200" Series
Coal-Forced air
90-250,000 B.T.U.



"200" Series
Coal-Gravity
70-183,000 B.T.U.



HI-CAP
COMMERCIAL & INDUSTRIAL
10 Sizes
OIL—GAS—COAL
330,000 to 1,000,000 B.T.U.

For complete specifications and information on special applications write or call....

Sycromatic Corporation

WATERTOWN, WISCONSIN

Manufacturers of fine heating equipment for nearly a quarter century.

the editor's notebook

R. W. Roose Joins HPAC's Staff

ROBERT W. ROOSE joined Heating, Piping & Air Conditioning's staff this month as HPAC's editor. C. M. Burnam, Jr., continues as editorial director. Until resigning to accept his new duties, he was research assistant professor of mechanical engineering at the University of Illinois, where he has been active for some years in studies on the fundamentals and practical applications of heating and air conditioning. Mr. Roose has also been a regular contributor to the pages of *American Artisan*.

After graduating in mechanical engineering in 1940 from the University of Illinois, Mr. Roose was in the industrial engineering department of a large plant until he was called into service as a reserve officer. He was an ordnance officer with the Air Force both in the United States and abroad. He was then assigned to the command and general staff school at Ft. Leavenworth.

After receiving his separation papers, with the rank of major, he took advanced work at Illinois — specializing in heating and air conditioning — and was awarded a master's degree.

Mr. and Mrs. Roose and their two sons have moved from Champaign to La Grange, suburb of Chicago.

First-Half Construction at Peak

EXPENDITURES for new construction were at the highest level in history during the first half of 1953, according to preliminary estimates of the U. S. Labor Department's Bureau of Labor Statistics and the Building Materials Div., U. S. Department of Commerce. Each month this year,



IF
you can find
a cubbyhole in a house —
you can sell a



The SUN line of oil- and gas-fired automatic furnaces includes a wide range of sizes and capacities — from the large industrial installation of 224,000 Btu down to the pint-size HI-BOY that will fit into any closet or cubbyhole. The tiniest home is a prospect for the compact, space-saving HI-BOY.

The SUN line is backed by over 50 years of experience in furnace design and manufacture so when you install a SUN FUEL-MASTER you know you are delivering the utmost in heating satisfaction and long life.

P. S. If you haven't seen the latest



ask for full details.



the editor's notebook

(continued)

spending for new construction has reached peak levels, and by the end of June totaled \$16 billion — almost 8 per cent above the January-June 1952 total. Private expenditures for new residential and public utility construction were the highest on record for any similar period.

During June, total outlays for new construction advanced 9 per cent to \$3.2 billion, and were 8 per cent above June 1952. Seasonal gains during June brought private outlays on commercial building (\$152 million) and public utilities (\$399 million) to an all-time monthly high. At the same time, June spending on private residential building (\$1.1 billion) was the greatest for any month in two and one-half years.



ANDREW LIND of Dundee, Ill., retires from business but still studies the *Artisan*

What is Complete Retirement?

"I FIND IT HARD to retire completely from this fascinating business of warm air heating and sheet metal work.

LOCKFORMER

...an investment from which all "gamble" has been removed!



Watch a Lockformer operate. Savings in time are almost fantastic. Work is of the highest quality and uniformity. Assembly of finished duct is simple and fast.



Talk to *any* Lockformer owner. 27,000 Lockformers, now in daily use, are ample evidence that the equipment is as trouble-free as human ingenuity can make it—that Lockformers are just about wear-out proof.

After a demonstration, sales talk is superfluous. If you make ducts, you need a Lockformer!



ONE MAN WITH A LOCKFORMER MAKES MORE PITTSBURGH LOCKS THAN SIXTEEN MEN WITH EIGHT BRAKES

THE LOCKFORMER CO.

4615 WEST ROOSEVELT ROAD • CHICAGO 50, ILLINOIS

the editor's notebook

(continued)

That's why I continue to look forward to each issue of the Artisan even though I've sold my business and am no longer engaged in active participation in the field where I spent 55 years. During my 30 years as a sheet metal contractor, I've seen warm air heating grow to be accepted by all of my customers as the best method of providing winter comfort, and I believe that the summer cooling industry will follow the same pattern and receive the same wide acceptance." With these words, Andrew Lind of Dundee, Ill., explained why he maintains his membership in the Fox Valley Furnace and Sheet Metal Contractors Association and the Sheet Metal Contractors National Association, and why he reads each issue of American Artisan from cover to cover. In his words, "It's to keep me up to date."

Sales Potential In Modernization

ACCORDING to the August bulletin of the National Warm Air Heating and Air Conditioning Association, a survey conducted recently in Minnesota shows that 153,000 house owners plan to remodel, rebuild or in some way modernize their homes this year. More than \$85 million will be spent.

Twenty thousand home owners indicated that they intend to remodel their basements. The bulletin points out that this presents an excellent opportunity for the warm air heating dealer to bring to the home owner's attention the advantages of a modern space saving winter air conditioning system. The survey also shows that 35,000 homes are scheduled for remodeled kitchens. This can mean new or re-located registers and ductwork. Seven-

HERE THEY ARE...SENTRY'S TWO NEWEST ADDITIONS TO THEIR EVER-POPULAR

AT-A-GLANCE TANK GAUGES

(DIRECT AND REMOTE)

THERMA-GAUGE

A superior quality, precision instrument with full view, solid red thermometer-type indicator

Without question, here is the easiest to read, accurate measure gauge on the market—And, the easiest to install, whether tank is empty, full or partially full. Unit features zinc base metal, two-piece die-cast assembly — Unbreakable red plastic assembly nut — Calibration chart, sealed between heavy, heat-resistant plastic domes — Brass rivets — And, a double coated cork float that's impervious to oil, many chemicals and acids. No gears, magnets, cams or tapes. Guaranteed to withstand in excess of 70 lbs. pressure per sq. inch. Tailor-made to fit individual tanks up to 12 ft. deep. Calibrated and factory adjusted.

QUICKLY, SIMPLY INSTALLED. Illus. at left shows how entire calibration and float assembly may be inserted and positioned after two piece die-cast tank plug has easily been installed in tank — only an ordinary wrench is needed.



SENTR-ECON

A new, durable, low cost instrument for economy installations.

Exceptionally high quality for such a competitively priced gauge. Features patented double dome with calibrations positioned between inner tube and outer heat-resistant plastic shell. Also, die-cast tank fitting — plated metals — brass rivets. No gears, magnets, cams or intricate mechanisms. Double coated cork float is impervious to oils, most chemicals and acids. Simple to install, even in partially-filled tanks. 1 1/2" openings only. Factory calibrated and adjusted to insure accuracy.

Write for complete details — literature




KRUEGER SENTRY GAUGES

GREEN BAY • WISCONSIN

the editor's notebook

(continued)

teen thousand home owners will add new rooms to their houses. Building an addition to an existing house always presents a heating problem, the bulletin says, because it generally changes the heat loss characteristics of the house for which the original heating system was designed. In some cases, the built-in room can mean the replacement of a gravity heating system with a forced warm air system, particularly if the addition of the room demands warm air runs longer than those which can be efficiently served by gravity warm air flow.

While these figures apply only to one state, the bulletin points to the \$6 to 9 billion home modernization market in the United States this year as evidence that similar sales opportunities for the warm air heating dealer exist in every other state as well.

Radiant Panel Heating Classes Scheduled

THE DEPARTMENT of Architecture at Pratt Institute, Brooklyn, will sponsor a series of meetings on radiant heating during the months of October and November. Authorities in the fields of design, research, equipment, and materials will participate in an overall analysis of this type of heating. Classes scheduled will cover the subjects of radiant heating in contemporary architecture, design standards, engineering design and installation, controls, the builders' and owners' viewpoints, and research and development.

Formula for More Sales

A FORMULA to meet "tougher" selling times ahead was outlined by William K. Fitch, chairman of the board,

The Right Register—

FOR EACH OF YOUR SMALL PIPE INSTALLATIONS

BY *Char-Gale*

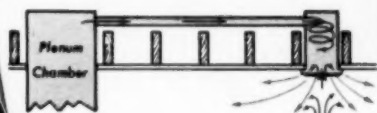
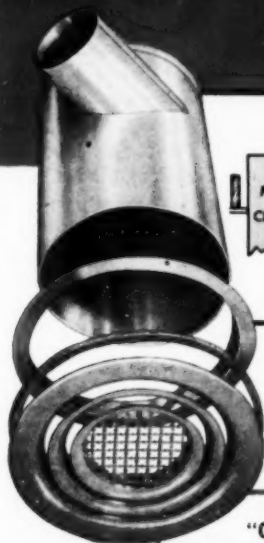
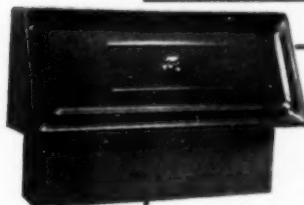


Diagram of typical Char-Gale "Gale-Aire" Ceiling Diffuser Installation.

A circular outward thrust imparted to the air entering the register box, produces a partial vacuum in the center of the cylinder. Room air is drawn up into the box and blended with the heated air to provide a gentle, effective warming action.

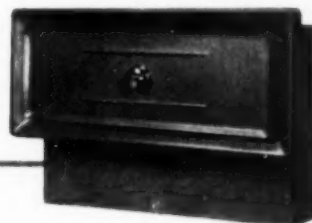
"GALE-AIRE" CEILING DIFFUSER

Newest Char-Gale register, the "Gale-Aire" Ceiling Diffuser is designed to provide effective air tempering and distribution. The unit includes a cylindrical box, fitting ring, foam rubber gasket, and register.



"GALE-AIRE" BASEBOARD REGISTER

Including all the features of the Sidewall Register, the "Gale-Aire" Angle Baseboard Register is designed especially for older homes. It is installed through a floor opening, with no wall cuts needed.



"GALE-AIRE" SIDEWALL REGISTER

The "Gale-Aire" Sidewall Register distributes air evenly in all directions along the wall. Adjustable, it permits complete balancing at the registers. Complete with register, box and a foam rubber gasket.



"GALE-AIRE" FLOOR DIFFUSER

Answers the need for an inexpensive method of distributing air along outside walls. Vanes set at proper angles to achieve a fan-shaped diffusion pattern.

Remember:

Char-Gale provides everything from plenum to register in the "Gale-Aire" System. Also a complete line of registers and fittings for your conventional installations.



Contact your jobber or write us direct

CHAR-GALE MANUFACTURING COMPANY

MINNEAPOLIS-MINNESOTA

the editor's notebook

(continued)

Dravo Corp., at the company's recent annual sales meeting. Mr. Fitch advised his salesmen:

"First, be very sure of the quality of your products and services. While many of you do not have direct responsibility for this quality, you are responsible for contacting our customers. So you must see that they are treated honestly, and that they are not only satisfied, but pleased that we are doing their work. Second, know more about your products than your competitors know about theirs. Study your catalogs, blueprints, and other literature. Read carefully your proposals to the customer. Understand the engineering and economic angles of the proposition you are trying to sell.

"Plan ahead. Plan what you are going to do tomorrow and the balance of this week. The time you are with the customer is what gets business — if by planning your itinerary you can see one more person each day, you will be making real progress. Let us also do long-range planning. We should be in on the ground floor and to do that we cannot wait until the prospect is ready for bids. You should help him do the preliminary engineering and calculation of savings. In many cases you can initiate the entire project. Remember that creative selling is more important now than ever."

Ventilation Conference To Be Held

THE AMERICAN INSTITUTE of Electrical Engineers, recognizing the importance of motor applications in the air moving industry, has arranged a conference on the application of motors to air moving equipment. It will



Vitroliner, the pioneer prefabricated chimney, is a complete packaged chimney ready for assembly on the job in one hour or less. Vitroliner is pre-cut at the factory — with a tailor-made roof flashing and flue housing that eliminates cutting or fitting on the job.

COMPARE ALL COSTS BEFORE YOU BUY

Reduced installation time makes Vitroliner the highest quality prefabricated chimney available at the lowest installed price. That's why they are nationally accepted and the choice of many leading home builders, prefabricators and single contractors as well.



Vitroliner is a quality product, engineered and constructed for long life. It is designed to harmonize with the architectural lines of ranch houses and today's modern homes, and can be finished in any architectural color scheme.

The standard flue housing is 19"x19" square and 21"x21" on the top. The De Luxe flue housing for larger homes is 19"x34" and 21"x36" on the top.

Approved by F.H.A. and listed by Underwriters Laboratories for ALL FUELS. Also approved by local building authorities and State Insurance Rating Bureaus.

- LOW INITIAL COST PER FT.
- LIGHTWEIGHT — 10 to 15 LBS.
- PROVIDES ATTIC VENTILATION.
- MANUFACTURED IN 6", 7", 8" and 10" DIA.

CONDENSATION

ENGINEERING CORPORATION

1531 W. POTOMAC AVE. CHICAGO 51, ILL.

Write for circular and quotation.

the editor's notebook

(continued)

be held at the Hotel Van Orman, Fort Wayne, on October 6 and 7. Subjects to be covered are: automatic temperature control of heating, ventilating and air conditioning air handling systems; fan motor characteristics and standards; the application of shaded pole motors to room air conditioners; desert coolers and the motors used on them; ventilation for farm buildings; armed services fan applications; requirements of air conditioning fan motors; UL requirements for fans; room air conditioners; selection and application of industrial fans; attic fans and window ventilators; furnace fans; automatic protection of motors in air moving equipment; and unit heater fans.

Trend to More Water Restrictions

A RECENTLY completed survey by the statistical department of Chrysler Corp. indicates a trend to increasing restrictions on unlimited use of water. "In just four years," according to C. E. Buchholzer, president, Airtemp Div., "the number of communities in the country restricting unlimited water usage has doubled." In 1949, he said, only 104 localities reported the passage of some type of regulation against unlimited water usage. The number of cities reporting water conservation measures in 1953 was 225.

Waiting Lists for Room Coolers

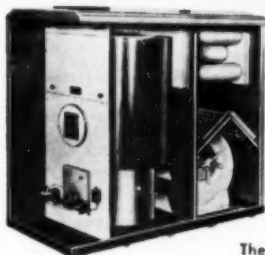
THE NATIONAL Chamber of Commerce reports that in those sections of the country where hot and humid weather conditions were prevalent this summer, merchants were buying up home cooling units as rapidly as they could be supplied. Waiting lists were common in St. Louis and

No "Choice-of-Fuel" Problems

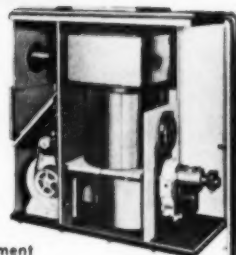
with
Luxaire[®]

**BASEMENT AIR CONDITIONING UNITS
UTILITY AIR CONDITIONING UNITS
GRAVITY FURNACES • COUNTERFLOW UNITS**

**Approved for either GAS or OIL
with equal efficiency**



The Basement
Air Conditioning Unit



**A
size for
any
installation**

As a gas-fired unit 70,000 to 250,000 B.T.U. Input

Luxaire dealers have the BIG answers to the BIG questions — "What's the fuel situation going to be" with the Luxaire Approved for Gas — Approved for Oil furnace line.

With Luxaire you have no choice-of-fuel problems! You have heating equipment so ingeniously designed so as to be approved for either gas or oil firing which provides the

As an oil fired unit 76,000 to 212,000 B.T.U. Bonnet

same satisfactory heating results with either fuel.

With Luxaire you can install the furnace NOW and decide on the type of fuel later! Also it is a quick, simple operation to convert from one fuel to the other at any time by simply changing burners.

See your Luxaire jobber NOW! Get the complete "one furnace for all automatic heating" story. Get the new low prices on Luxaire.

ALSO: Horizontal Gas Furnaces . . . Horizontal Oil Furnaces . . . Coal Fired Furnaces, steel or cast iron . . . Unit Heaters . . . Blower Filter Units . . . Fuel Oil Tanks . . . Incinerators . . . Year 'Round — Heats in winter, cools in summer — and Summer Air Conditioning Units.

THE C. A. OLSEN MANUFACTURING COMPANY . . . ELYRIA, OHIO
Luxaire HEATING & AIR CONDITIONING UNITS

the editor's notebook

(continued)

Houston. In Houston, even the jail was comfortably air conditioned.

Gas Furnace Shipments Up

SHIPMENTS of gas fired warm air furnaces for the first six months of 1953 are estimated at 326,300 units, or 17.9 per cent more than for the same period of 1952. Gas conversion burners shipped during the first six months of 1953 totaled approximately 81,200 units. Oil fired burner installations for the first half of 1953 totaled 252,326.

Bovine Heat Warms Home

ENGINEERS of the Minneapolis-Honeywell Regulator Co. were much intrigued by a recent report that a farmer was heating his home by piping in warm air from the barn. According to the report, a pleasant temperature was maintained in the barn by heat given off by its bovine tenants. The engineers, figuring that a cow gives off about 3500 Btu per hour and that it takes 80,000 Btu to heat a medium size house for an hour, arrived at the conclusion that it would take 23 cows to keep an average size home at comfortable temperatures.

Air Conditioning Plays Starring Role

"IT'S IN THE AIR," a 20-minute color film being distributed by Airtemp Div., Chrysler Corp., to schools, business groups, etc., demonstrates the importance of the role played by air conditioning in modern living. The film points out how heat and cold, humidity, and airborne dust particles, dirt and pollen affect the lives of average people, and shows how air conditioning, through the control of these factors,

the editor's notebook

(continued)

contributes to comfort and health in everyday living. The principles of air conditioning are illustrated in a visit with an average family in a typical air conditioned home.

Sees Huge Rise In Heat Pump Sales

H. M. BRUNDAGE, general manager, Weathertron department, General Electric Co., recently predicted that by 1962 sales of units operating on the heat pump principle will have reached an annual volume of \$400 million.

Interest Rates Up On FHA Debentures

FHA COMMISSIONER Guy T. O. Hollyday recently announced increases in interest rates on Federal Housing Administration debentures. For all 10 year debentures issued in connection with mortgage insurance programs, the interest rate will be $2\frac{3}{4}$ per cent, and the rate on all debentures having a term in excess of 10 years will be increased from $2\frac{3}{4}$ per cent to 3 per cent. The increased rates, concurred in by Treasury Secretary Humphrey, are effective with respect to mortgages insured on and after July 8, 1953.

60,000 Homes to Be Conditioned This Year

ACCORDING to a prediction by Cloud Wampler, president, Carrier Corp., 60,000 homes will be equipped with year 'round air conditioning during the year 1953, and by the end of 1958 more than half of all new homes in the country will have complete air conditioning. He says at least 75 manufacturing firms will be competing for air conditioning business by the end of this year.



ONE AND ONLY ONE OIL BURNER

GIVES YOU ALL THESE POINTS OF DIFFERENCE

- 1 **BRASS BUS BARS**—Assures positive, safe ignition. No springs or wires.
- 2 **TRANSFORMER**—More turns of wire and more coil laminations give a longer life even under low voltage conditions. Aluminum foil shield eliminates radio and television static.
- 3 **PATENTED NOZZLE SHIELD**—Eliminates carbon deposits which reduce efficiency as much as 20% in one season!
- 4 **COMPLETE LINE**—Nu-Way builds a complete line of oil burners for domestic, commercial installations.
- 5 **EXCEEDS UNDERWRITERS' REQUIREMENTS**
- 6 **32 YEARS EXCLUSIVE MANUFACTURE**

AND THAT ONE IS
Nu-Way

THERE'S A PROFITABLE DIFFERENCE in Nu-Way! Write today for full details on the Nu-Way line.

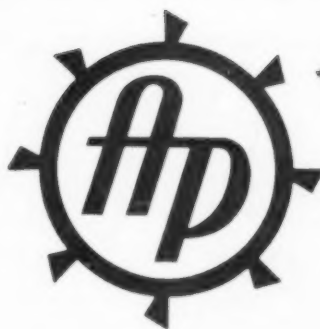
THE NU-WAY CORPORATION
ROCK ISLAND, ILLINOIS

Sold through Jobbers and Distributors. Also Special Applications for Furnace and Boiler Manufacturers.



LOOK FOR THE FLAME

"Automatic Oil Heat Exclusively Since 1921"



does it again!

FOR THE FIRST TIME... 2 AND 3-TON A-P EXPANSION VALVES WITH EXTERNAL EQUALIZERS

Down through the years, the refrigeration industry has come to look to A-P for many important "firsts." Now, far-sighted A-P engineers have produced another "winner!" It's the new Model 205-CE thermostatic expansion valve . . . available for the first time with external equalizers — in 2 and 3-ton sizes, for Freon 12 or Freon 22.

This new valve, an adaptation of the job-proved 205-C, is ideal for furnace air-conditioning units . . . new or replacement. Both 2 and 3-ton sizes employ the field-tested, leak-free A-P method of sealing the pins, to give a packed-pin construction which will withstand many years of rugged service.



MODEL 205 CE
for Freon 12
and Freon 22



And here's why the Model 207-C is still an ALL-INDUSTRY "FIRST"

- 1 It's now made with or without external equalizer . . . for Freon 12, Freon 22 or Methyl Chloride . . . in 1/2-ton and 1-ton sizes.
- 2 Versatile A-P liquid charge makes valve ideal for all applications . . . low temperature, commercial or air-conditioning.
- 3 It maintains "straight-line" superheat. Less than 1/2 variation from -20° to +40° suction temperature.
- 4 New smaller size plus ease of installation make it a real boon to servicemen. Fits handily in those hard-to-get-at corners.
- 5 Jobbers need stock only one valve type to meet an exceptionally wide variety of demands.
- 6 Service organizations need buy fewer valves to have units available for all emergency repairs. Shop and truck service stocks can be kept to a minimum.

FREE—
Big New Application
Manual

Just published! New A-P Product Application Manual gives valuable information on use of all refrigeration valves, strainers, dryers, etc. Send for your copy today.

A-P CONTROLS CORPORATION

2452 N. 32nd Street, Milwaukee 45, Wisconsin
In Canada: A-P Controls Corp., Ltd., Cookville, Ontario

Thermostatic Expansion Valves

Automatic Expansion Valves

Filters and Dryers

Solenoid Valves

... For air... liquids

... gases... refrigerants

DEPENDABLE Controls

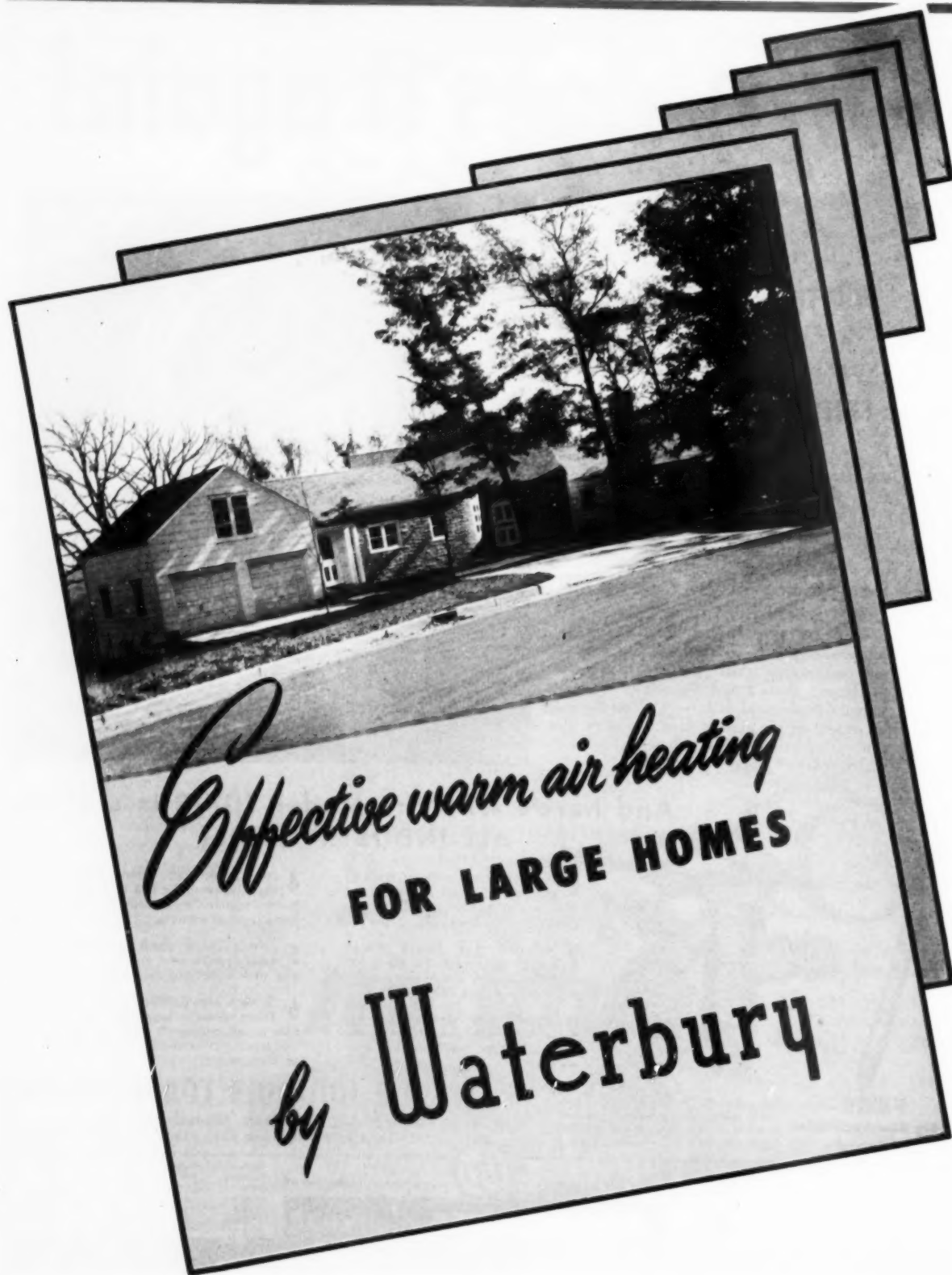
Pressure-Regulating Valves

Custom-Built Valves

Water-Regulating Valves

Pressure-Limiting Valves

Keep up with the literature



Effective warm air heating
FOR LARGE HOMES

by **Waterbury**

your customers are reading

Every day, from all over the country, letters of inquiry keep coming in to the Inquiry Service Department of the Waterman-Waterbury Company. They come in response to our national advertising campaigns, to publicity placed in the Home Planning Kit that is going to some 80,000 home planners this year, and to the prompting of builders and architects and of friends who own a Waterbury furnace or winter air conditioner. How well are YOU prepared to answer the questions of a prospective customer about the Waterbury line? What will you say to your customers when they insist on zoned heating?

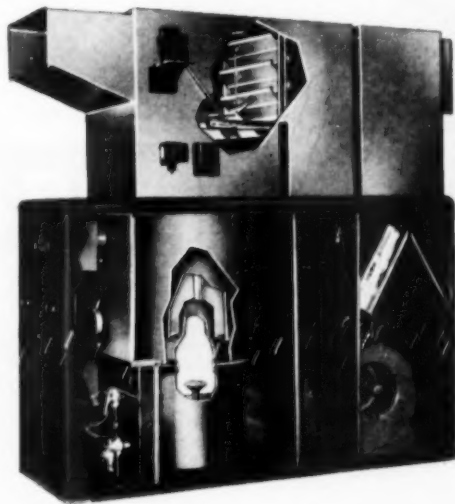
When they demand ZONING...

The Waterbury Comfortrol system of zoned heating provides customer satisfaction.

Zone control is the latest trend in home heating. With zoned heating a uniform temperature can be maintained throughout the house or different temperatures in different parts of the house. *Many Waterbury units will provide zoned heating without any changes; all Waterbury units can be adapted to it.* The complete Waterbury line of quality furnaces, air conditioners and conversion burners includes units to satisfy the requirements of any customer. All furnaces and air conditioners are guaranteed for ten years.



The Bonderite seal on every Waterbury unit means protection against corrosion and rust; another Waterbury feature.



Comfortrol By-Pass systems can be installed in various combinations. Shown here is a typical installation.

The Waterman-Waterbury Co.

OVER 46 YEARS OF WARM AIR HEATING

1122 JACKSON ST. N. E. • MINNEAPOLIS 13, MINN.

up to 50%
it pays ¹ to think

FIRST

about fastening costs

Fastening is a final operation, but it pays to think about it when you start the job.

Think first about your fastening method. Every costwise sheet metal man knows there is nothing else as simple and speedy as the secure fastenings made with P-K Type A. But are you using them *everywhere* they can save . . . instead of soldering, riveting, or other slow methods?

Think *first* about fastener quality, too. Why gamble on weak heads, blunt points, soft threads, when you can make sure of guaranteed first quality, in every screw,* by specifying Parker-Kalon, the *original* Sheet Metal Screw.

The booklet offered below will bring you up to date on the whole family of P-K Self-tapping Screws. Samples, too, on request. Parker-Kalon Corporation, 200 Varick St., New York 14.



P-K Type A
— the FIRST Self-tapping Screw



The
INDUSTRIAL
DISTRIBUTOR
steers your
Supply Dollars
to the best
values.

PARKER-KALON®

The Original

SELF-TAPPING SCREWS



GET THIS GUIDE TO TROUBLE-FREE FASTENING

Tells you "where to use what" type of screw in all types of sheet metal, including stainless steel. Gives complete information on hole sizes and application data for all types of P-K Screws. Ask your P-K Distributor, or write Parker-Kalon for Form 480.

This mark  on every P-K Self-tapping Screw identifies it as genuine.

3 NEW COMPACT GAS HORIZONTALS

70,000-85,000-105,000 B.T.U.

A big market is waiting for them



With these three new Armstrong gas-fired horizontal furnaces you can go right along with the modern builder's idea that size and location of space assigned to the heating plant are of minor importance. You can fit them into almost *any* space; you can deliver heat from almost *any* location.

Yes, and without sacrificing profit, without worrying about your reputation. These furnaces are efficient and long-lived. They look good. They install easily.

Although they sell at attractive prices, there is no quality-cutting. They are full-quality Armstrong "Indoor Sunshine" winter air-conditioning furnaces. Completely equipped; assembled at the factory.

Ideal for crawl space, attic installation or suspended. Built for residential, commercial and industrial use. The largest size is just 49 $\frac{1}{4}$ " long, 16 $\frac{1}{4}$ " deep and 22 $\frac{3}{4}$ " high.

If you were to specify design and construction for a line of gas horizontals you'd write our Specification Sheet S-35. Drop a card to us for your copy. See for yourself.

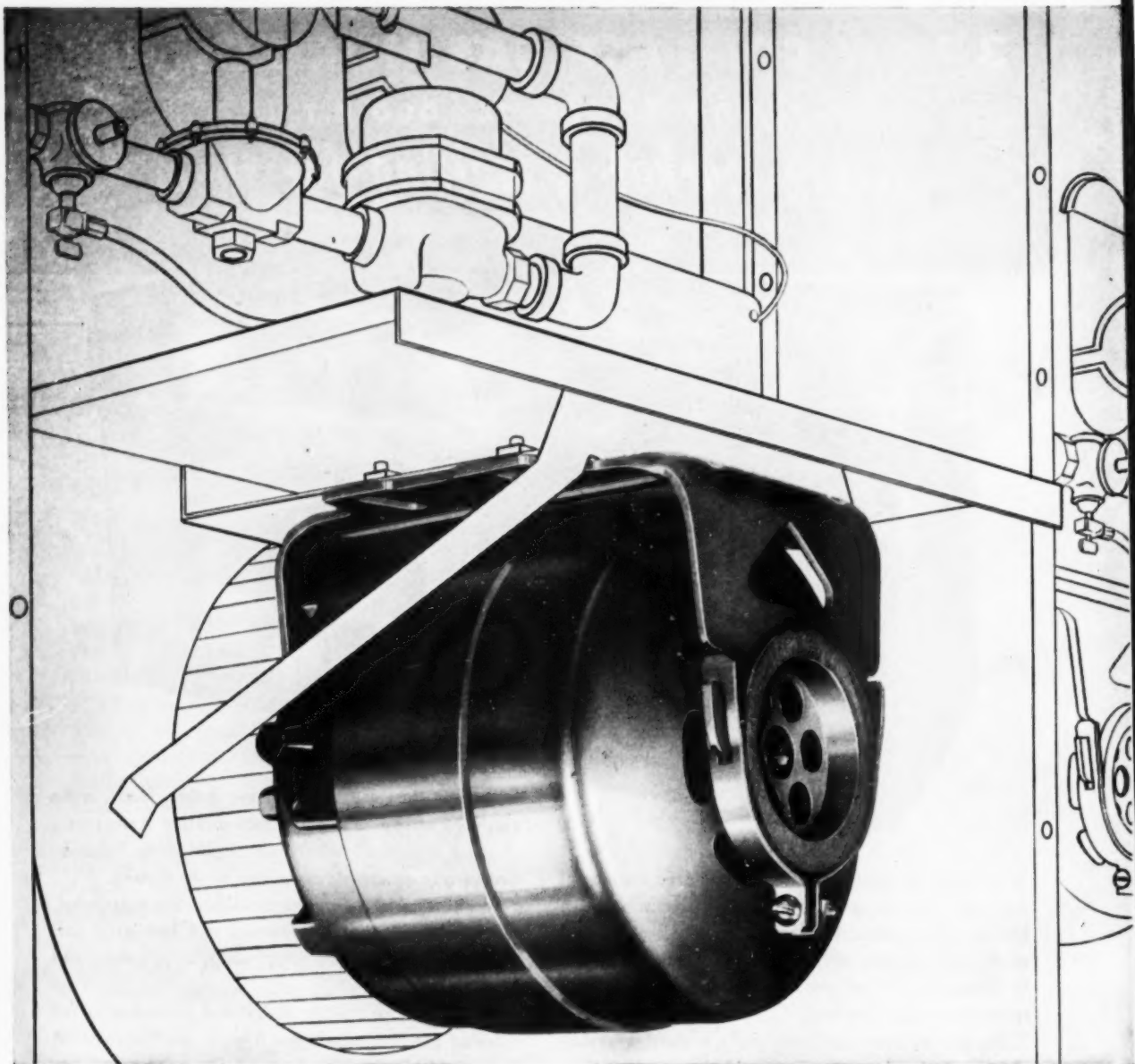


Armstrong's two huge plants serve both sides of the continent quickly, economically. A warehousing distributor, with a complete Armstrong inventory, is within a stone's throw of everywhere. Wherever you are, Armstrong's distribution system is set up to serve you. It's better, quicker, more profitable . . . for you.

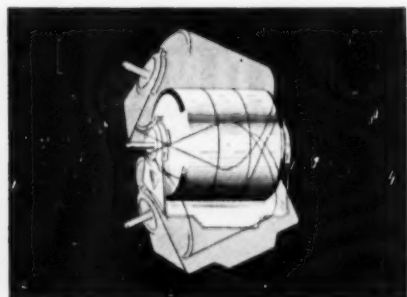
Please address Dept. AA at our plant nearest you.



Warm-Air Furnaces—Gas, Oil, Coal—A Complete Line



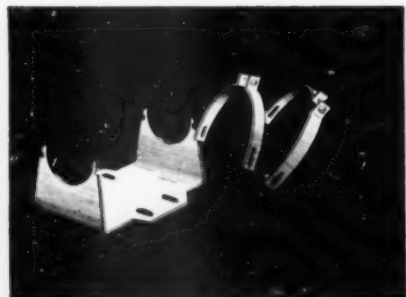
Here are *SIX* good reasons why your product



1 VERSATILE all-angle unit bearing design and sealed-in lubrication system permit motor to be mounted in any position.



2 ATTRACTIVE APPEARANCE of motor improves the appearance of your product in applications where the motor will be visible.



3 MOUNTING CONVENIENCE helps solve product design problems. Use resilient cradle-base or end-ring mounting.

This motor drives a furnace fan...

G-E Shaded Pole Motors Can Help Sell Your Products too

Furnace manufacturers know that using a good motor in their product pays off. From the design stage . . . through production . . . through fast selling, they know that the General Electric shaded pole motor is their best bet for a far better product.

Your product, too . . . whether you design and build furnaces, cooling fans, unit heaters, condensing coolers, exhaust fans, evaporative coolers, or others . . . can be made a better product by using this versatile G-E shaded-pole motor with unit bearing construction.

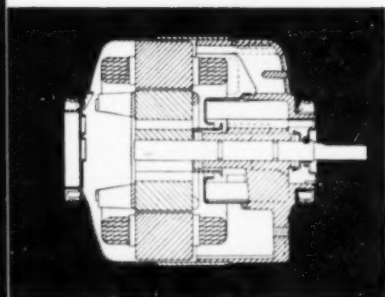
Look at the outstanding advantages of this motor . . . all-angle operation, lubrication for life, streamlined appearance, light weight and quiet operation, plus dependability. All the features you want in a motor. *Here* is a motor that will help you sell your product.

For complete information on ratings that are available contact your nearest General Electric Apparatus Sales Office today. General Electric Company, Schenectady 5, N. Y.

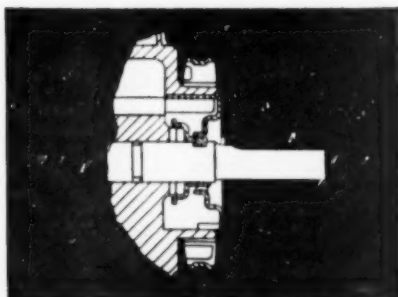
704-3

You can put your confidence in—
GENERAL  ELECTRIC

should use a G-E Shaded Pole Motor...



4 QUIET OPERATION is a feature everyone wants. This is gained by accurate alignment and positive lubrication.



5 LUBRICATED FOR LIFE avoids inconvenience of adding lubricant . . . reduces maintenance to a minimum for trouble-free operation.



6 "EQUIPPED WITH G-E MOTOR" helps sell your product by backing it up with G.E.'s reputation for quality motors.

NIAGARA Announces

1. YEAR-ROUND AIR CONDITIONING



**Provides
Summer Air
Conditioning
... DOUBLES
Profit
Opportunities**

Niagara refrigerated-air Home-Cooling Units are designed to use the blower, filter and ductwork of the forced-air furnaces beside which the units are installed. Semi-hermetically sealed compressor, cleanable tube condenser and liquid refrigerant (Freon) receiver, all serviceable on location. Operate with low voltage room control.

The cooling units are designed to match the famous Niagara Series 50 AC furnace with the exclusive Niagara cast-iron heat exchanger — installable also with your customers' present forced-air furnaces of ANY reliable make.

Cabinets of 2-ton and 3-ton capacity units are 22"x37"x47½" high.

2. NEW CONVERTIBLE OIL-GAS FURNACES ... New Economy for Suburban Homes

These furnaces are the ideal solution to the problem of many thousands of forward-looking home owners, builders and remodelers seeking the utmost flexibility in a practical, modern, automatic home-heating system for today . . . and *for years of tomorrows!*

Easily convertible with new Niagara Gas Conversion Burner.

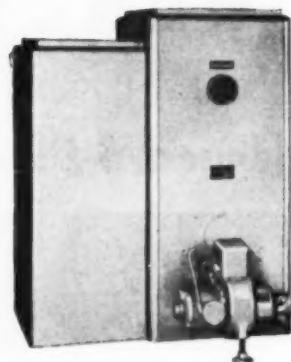
Exclusive Niagara rectangular heat exchanger permits exceptional compactness.

Available with or without burner hood which accommodates either gas or oil burner.

Also available in Down-Flow and conventional Hi-Boy models.

Sizes for large, medium and small homes.

WRITE for complete information.



Oil-fired AC unit. (Available also as gravity furnace — without blower-filter unit which is installable on either side.)

NIAGARA FURNACE DIVISION

The Forest City Foundries Co., 2500 West 27th Street, Cleveland 13, Ohio

HOME-HEATING EQUIPMENT MANUFACTURERS SINCE 1890



ADAMS

INSHOT GAS CONVERSION BURNER

ONLY 4" DIAMETER!

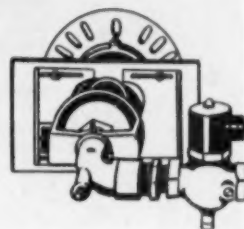
ONLY 7" LONG!

The **ONLY** conversion burner designed especially to convert Gun-Type Oil-Fired Units to Automatic Gas Heat!

- Completely Automatic
- Simpler to Install and Service
- Wider Application



At right is a front view of the burner with 6 1/4" x 10" plate. Also illustrated is the universal cast iron mounting flange.



At left 14" x 24" front plate.



36-Month Factory Warranty
Factory warranty against defective materials or workmanship in the burner assembly for three years. Controls such as thermostat and pilot are covered by regular warranty of control manufacturers.

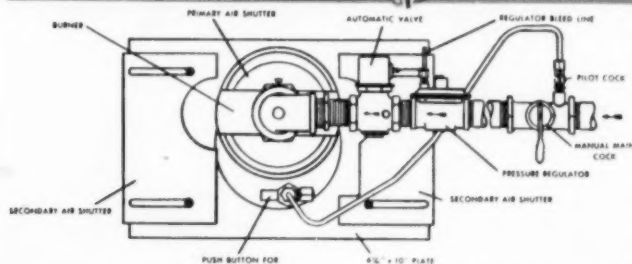


FIG. 1 FRONT VIEW OF BURNER — 6 1/4" x 10" FRONT PLATE

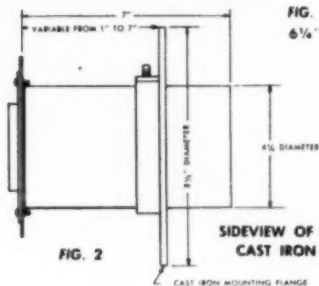


FIG. 2

SIDEVIEW OF BURNER SHOWN WITH CAST IRON MOUNTING FLANGE

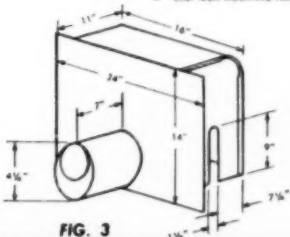


FIG. 3

ILLUSTRATION OF BURNER WITH 14" x 24" FRONT PLATE AND CONTROL COVER.

Runner Flame Pilot Lighter



A&A Tested and Certified

SPECIFICATIONS 4H SERIES INSHOT GAS CONVERSION BURNER

Model	Valve Size	Regulator Size	Maximum Btu/Hr. Nat. or Mxd.	Mfd.	Shipping Weight
4HC	1/2"	1/2"	140,000	95,000	21 lbs.
4HE	3/4"	3/4"	180,000	140,000	22 lbs.
4HA	1"	1"	180,000	180,000	27 lbs.
LIQUEFIED PETROLEUM GAS					
4HLP	1/2"		170,000		2 1/2 lbs

MINIMUM INPUT RATINGS:

Models 4HC and 4HE, for use with natural gas — 105,000 Btu/Hr.
Models 4HC, 4HE and 4HA, for use with manufactured gas—50,000 Btu/Hr.
Model 4HLP — 90,000 Btu/Hr.

All necessary controls are furnished except limit control. Burners for use with natural or mixed gas are equipped with a solenoid type gas valve, or with General self-generating controls, (PG-9 pilot generator, B-60 valve). Burners for use with manufactured gas are equipped with a diaphragm type valve and also include a gum filter. Model 4HLP is equipped with General self-generating controls with 100% shutoff type safety pilot.

*Cast-iron mounting flange, (shipping weight approx. 3 lbs.) runner flame pilot lighter, and cover (shipping weight approx. 6 1/2 lbs.) to conceal controls, (for use with 14" x 24" front plate only) available as optional equipment.

ADAMS

MANUFACTURING CO.

1530 ST. CLAIR AVE.
CLEVELAND 14, OHIO
Phone: Superior 1-8325

THERE ARE 5-WAY PROFITS WITH THESE



You can't buy an insurance policy on your reputation. That's why many furnace manufacturers, wholesale distributors and dealers depend on Peerless. Peerless BLOWER-FILTER Package Units assure long-term customer satisfaction. They move from 1100 to 6600 c.f.m. and are equipped with heavy-duty Peerless Motors selected for long life and quiet operation. Certified Dimension Prints on any Peerless Blower are furnished on request.

F A N A N D B L O W E R D I V I S I O N

FOR YOU THIS SEASON PEERLESS BLOWERS

1

PROTECTION against direct and cutthroat competition is assured when you deal with **PEERLESS ELECTRIC**. We sell through wholesale distributors and dealers exclusively. We depend on them and they depend on us. That's why they get the best possible deal every time.

2

COMPETITIVE PRICES are set and held. Peerless manufactures and sells complete units so that it controls costs and prices. You buy from one supplier, get shipments from one supplier and stock complete units to cut handling and inventory costs.

3

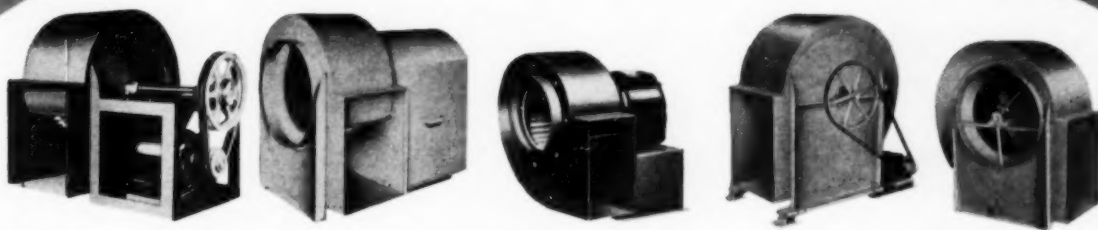
MORE TO SELL when you sell Peerless products. You can sell Peerless quality . . . Peerless specifications . . . Peerless on time deliveries . . . Peerless engineering data and services . . . **PLUS** a complete line of blowers.

4

NO CALLBACKS with Peerless because 60 years' experience is built into every blower. Materials are the best, engineering details are proven and workmanship has definite inspection control.

5

ENGINEERING SERVICE is available to you on all installations, regardless of size. If necessary, a Peerless Engineer flies to your office. Peerless concentrates on your kind of job . . . the "middle-sized job."



BELT DRIVE UTILITY BLOWER

Sturdy arc-welded housings and frames finished in green baked-on enamel. Blowers furnished for clockwise rotation and bottom horizontal discharge. Housings convertible for discharge at any angle. Motor pulley adjustable for varied speeds. Weatherproof drive covers available for all sizes from $1\frac{1}{4}$ to 7 $\frac{1}{2}$ H.P.

DIRECT DRIVE BLOWER

For general ventilation and exhaust with ducts in washrooms, boiler rooms or other limited areas. Motors available for all currents. Cast iron hubs support the dynamically balanced wheels.

ARR.3 BLOWERS

With clock or counterclockwise rotation, blower is easily adaptable to ventilation and exhaust systems. Width is single or double. Motors and drives available. Vibration bases optional. Ball or sleeve bearing construction optional.

"SMOOTHEST PERFORMERS ON THE MARKET"

THE PEERLESS ELECTRIC COMPANY

1405 WEST MARKET ST. • WARREN, OHIO

*Peerless
Electric*

Here's a low-cost motor for all kinds of damper applications

Here are the motors you need to make installations easier and to increase profits on damper applications! These Honeywell models give you more flexibility of usage. This enables you to sell more damper motors because you have a model to meet all kinds of job applications.

Dealers find quality features plus the Honeywell name make these motors easy to sell! For example, the smooth, quiet hydraulic operation and "fail-safe" cut-off features are sure to please customers.

For full information mail coupon on opposite page or call your local Honeywell office.



Plug-in Model M828A

This plug-in type motor is ideal for hand-fired installations. Easy to install. Can be used with any of four Honeywell thermostats.

\$19.80



Transformer Model M828C

For use with a separate transformer. Can be used with any of the four different Honeywell thermostats, shown on opposite page.

(price includes transformer) **\$24.80**



*Another Plus-Profit
Product from Honeywell*

Increase your profits by selling Honeywell Heat Regulator Packages

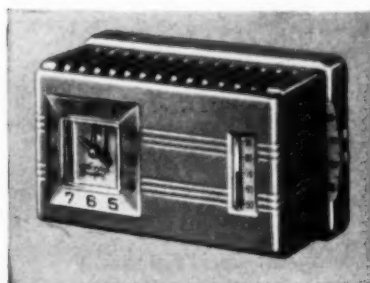
Everyone wants automatic heat control—and here's a complete package to help you cash in on this natural demand! It consists of a Honeywell damper motor and one of the famous Honeywell thermostats, plus necessary installation accessories (see table below).

Honeywell Heat Regulators sell better, because most people are familiar with Honeywell's famous reputation for quality—and thus your

prospects are more receptive from the start.

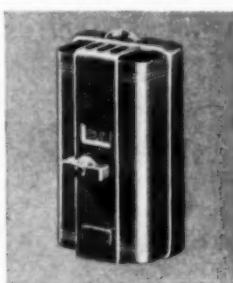
Promotion of this package often leads to many new customers—in addition to developing sales among your regular customers. And of course, these are *extra sales*—and *extra profits*. So why not make your plans now to take advantage of this fine profit opportunity.

Phone your local Honeywell office or mail coupon below for all the details.



Electric Clock Thermostat

Gives completely automatic control; turns heat down at night—up in the morning.



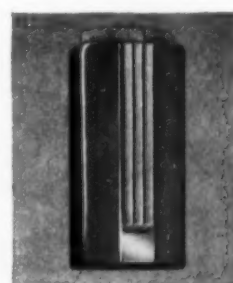
Time-O-Stat

Automatically turns heat to desired setting in morning.



New Round Thermostat

The very latest development in manual thermostats.



T824 Thermostat

Gives accurate damper control at economical price.

Honeywell Heat Regulator Packages

Y228A Clock Thermostat, M828A Motor, accessories

\$59.30

Y231A Time-O-Stat, M828A Motor, accessories

\$42.30

Y318A New Round Thermostat, M828A Motor, accessories

\$33.60

Y219A Thermostat, M828A Motor, accessories

\$27.00

Y228B Clock Thermostat, M828C Motor, accessories

\$64.30

Y231B Time-O-Stat, M828C Motor, accessories

\$47.30

Y318C New Round Thermostat, M828C Motor, accessories

\$37.60

Y219C Thermostat, M828C Motor, accessories

\$32.00

MINNEAPOLIS
Honeywell



First in Controls

MINNEAPOLIS-HONEYWELL REGULATOR CO.
Department AA-9-188 Minneapolis 8, Minnesota.

Gentlemen:

☐ Please send me complete information and consumer sales aids on Honeywell Heat Regulator Packages.

☐ Please send me information on Honeywell Damper Motors.

Name

Firm Name

Address

City..... Zone..... State.....

"My Indiana dealers and distributors
really go for our **NEW**
Viking BLOWER LINE

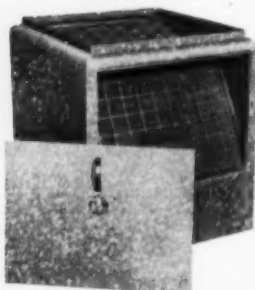
— Just 6 models in 3 types
TO SATISFY ALL KINDS OF CUSTOMERS
— and a one-man installation which
UPS PROFIT CONSIDERABLY."



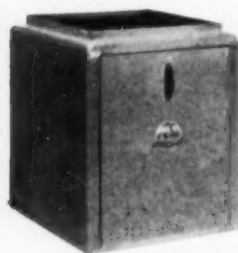
says Woody Faison, Friendly Viking Representative



SERIES '400'
Qui-Ette Streamline
Models for Popular
Size Furnaces
up to 28"



SERIES '300'
For Larger Furnaces
up to 36"



THE '777'
WITH DIRECT DRIVE
For Small Furnaces
up to 18"

**LOOK WHAT PHILIP R. HEDBACK, PROMINENT
INDIANAPOLIS DISTRIBUTOR, SAYS . . .**



"Viking Blowers are the answer to a distributor's prayer. For one thing, I can stock a minimum of models and meet all my customer's needs. My dealers like them because features like easy motor mounting and wiring, and plenty of working space inside unit permit more profitable one-man installation. I think they're right up our alley. I like them."

PHILIP R. HEDBACK, Bryant-Hedback Co.
1835 N. New Jersey, Indianapolis, Ind.

**DEALERS ALL AGREE VIKING BLOWER PACK-
AGES ARE ONE SWELL WAY TO MAKE MONEY**

LEX BALFOUR, Balfour Heating Co., Inc.
1616 Meridian St., Anderson, Ind.

"The more time I save on installation, the more profit there is in the job for me. Since I've handled Viking Blowers . . . I save up to 45 minutes per installation. That snap-out filter ledge makes it easy to get into the cabinet to work without squeezing and squirming and without skinning my knuckles. Viking gets my vote every day."



"Viking Blower Packages really wow all my customers with their streamlined styling and good looks. The easy wiring and adjustment that you get with the detachable motor mount lets me do the job faster. Add to that, quiet operation, trouble-free parts, and once a year lubrication with the Univolt bearing and no wonder you just install a Viking Blower Package and then forget it."

WILLIAM M. DOWDELL, JR.
Bryant Gas Heating Serv., Inc.
541 N. East St., Indianapolis, Ind.



ATTIC FANS



BLOWER WHEELS



BLOWER ASSEMBLIES



HUMIDIFIERS



PACKAGE BLOWERS



WINDOW FANS

**Profit from
DOUBLE-BARRELED
SELLING
with the**

MONCRIEF DOUBLE-FEATURE LINE

with units approved for
either Gas or Oil!

CONVERT ANYTIME . . . Simply Change Burners!

If your customer wants to burn gas, sell him Moncrief!
If your customer wants to burn oil sell Moncrief!
If your customer doesn't know whether he is going to get a permit to burn gas, you still sell him Moncrief because — Moncrief furnaces are approved for *either* gas or oil and give the same satisfactory heating with either fuel. Start with Oil. Change to Gas at any time!

It is a simple burner changing operation. There is no changing of the furnaces or duct work.

See your Moncrief jobber today. Get the double-barreled selling story of the double-feature Moncrief Line.

It's Moncrief also for finest, most complete line of furnace Pipe, Fittings, Prefab Duct.

THE HENRY FURNACE COMPANY • Medina, Ohio

COUNTERFLOW UNIT



As an Oil Unit
75,100 to 84,100 B.T.U.
at discharge outlet



As a Gas Unit
95,000 to 115,000
B.T.U. Input

UTILITY A.C. UNIT



As an Oil Unit
75,100 to 106,000
B.T.U. at Bonnet



As a Gas Unit
95,000 to 125,000
B.T.U. Input

GRAVITY FURNACE

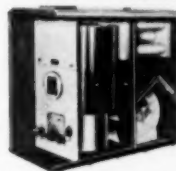


As an Oil Unit
71,200 to 100,000
B.T.U. at Bonnet

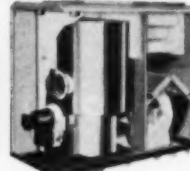


As a Gas Unit
85,000 to 130,000
B.T.U. Input

BASEMENT A.C. UNIT



As a Gas Unit
70,000 to 250,000
B.T.U. Input



As an Oil Unit
76,000 to 212,000
B.T.U. at Bonnet

HEATING AND AIR CONDITIONING UNITS

MONCRIEF

FURNACE PIPE AND FITTINGS

WHY IT PAYS TO BUY STEEL FROM WAREHOUSE



You don't waste productive space storing steel!

WHEN YOU BUY STEEL FROM WAREHOUSE, YOU GET:

- LOWER INVENTORY COSTS
- LOWER SPACE COSTS
- LOWER TIME COSTS
- LOWER CAPITAL INVESTMENT
- FASTER PRODUCTION
- FEWER INVENTORY LOSSES

YOU can turn your present steel storage space into profitable production space—without danger to the continuity of your steel supply. Just use a U. S. Steel Supply warehouse as your own. U. S. Steel Supply can deliver the steel you want to your plant or job site at whatever time you desire. Ask your U. S. Steel Supply salesman to arrange delivery of your steel at *your* convenience—and you'll find your steel arriving with timetable dependability.

U. S. STEEL SUPPLY DIVISION

General Office
208 So. La Salle St., Chicago 4, Ill.



Warehouses and Sales Offices Coast to Coast

UNITED STATES STEEL



SEQUOIA

*opens the door to more small home sales,
more profits, with a new Horizontal Model*

CENTRAL FORCED AIR GAS HEAT

In the *small home* field this magic phrase means one important thing—an easier sale! Heating dealer to builder or builder to prospective buyer, central heating stands for extra quality. It's the one big home comfort feature most wanted by every small home buyer!

The market's best furnace for capturing your share of these new profits is SEQUOIA'S new 70,000 BTU *Horizontal*. Here's proof:

To the cost-conscious dealer, its direct drive en-

gineering makes possible a famous SEQUOIA-quality forced air furnace at a price competitive to wall heater systems.

To the space-conscious builder, its height of only 17 inches . . . plus adaptability to minimum attic or under-house clearance . . . assures its choice as the ideal small home heating unit.

SEQUOIA'S new 70,000's are ready now for immediate delivery in any desired quantity. Meet FHA-VA minimum heating specifications—carry a full SEQUOIA ten-year guarantee.

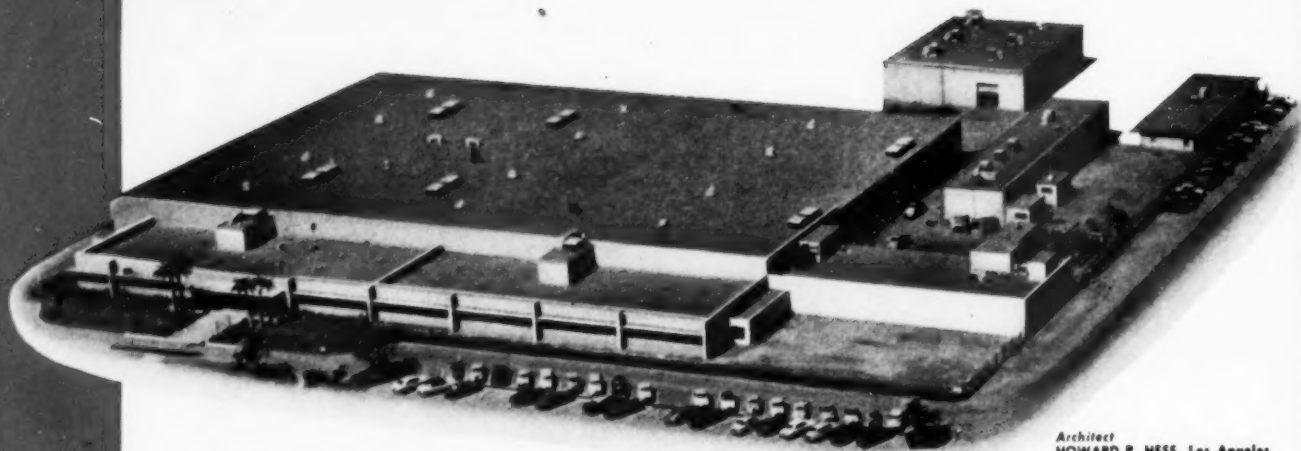
NOW 5 HORIZONTALS! 70,000-80,000-100,000-120,000-150,000. WRITE FOR COMPLETE LITERATURE.

*Aggressive jobbers and
dealers seeking a progressive
furnace manufacturer to
represent, are invited to
write today to—*

Sales Department

SEQUOIA MANUFACTURING CO.

1000 Brittan Avenue • San Carlos 3, California



Architect
HOWARD P. HESS, Los Angeles
Engineer
DONALD DOUGLAS, Los Angeles
Builder
PANELCRETE ENGINEERING CO.,
Phoenix

AiResearch Manufacturing Company of Arizona builds for economy today, easy expansion tomorrow ... installs **MILCOR** Steel Roof Deck

ALL materials selected for this new Phoenix plant were measured by three requirements: utility, speed of installation and easy integration with future construction. Milcor Steel Roof Deck qualified and was chosen.

Horizontal expansion of the new plant's 100,000 sq. ft. primary core was planned for in the design. Steel frame construction covered with Milcor Steel Roof Deck will permit future expansion to 750,000 sq. ft. with no break in production.

Many architects specify Milcor Steel Roof Deck for versatility like this — and for other advantages: Savings on structural supports. Ease and Speed of installation. High strength/weight ratio. Fire resistance. Low maintenance cost.

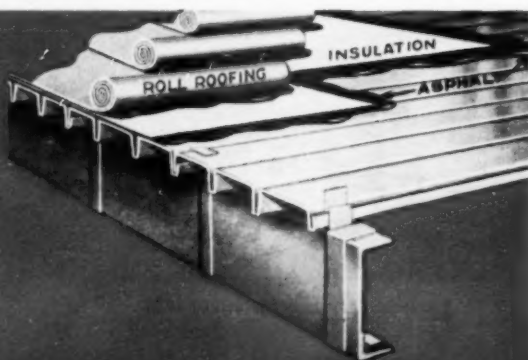
For help in planning efficient use of Milcor Steel Roof Deck on your jobs, see the Milcor Manual in Sweet's — or call on our engineering service.

*Reg. U. S. Pat. Off.

INLAND STEEL PRODUCTS COMPANY

4023 WEST BURNHAM STREET • MILWAUKEE 1, WISCONSIN
BALTIMORE 5, MD. — 5300 Pulaski Highway • BUFFALO 11, N. Y. — 64 Rapin St. •
CHICAGO 9, ILL. — 4301 S. Western Blvd. • CINCINNATI 25, OHIO — 3240 Spring Grove Ave.
• CLEVELAND 14, OHIO — 1541 E. 38th St. • DETROIT 2, MICH. — 690 Amsterdam Ave. •
KANSAS CITY 41, MO. — P. O. Box 918 • LOS ANGELES 58, CALIF. — 4807 E. 49th St.
• NEW YORK 17, N. Y. — 230 Park Ave. • ST. LOUIS 10, MO. — 4215 Clayton Ave.

Interlocking sides and overlapping ends (with ribs offset for easy nesting) speed installation of Milcor Steel Roof Deck. Sheets may be welded or anchored with clips. You get a perfect base for insulation and roof covering.



SMCNA Appoints Committee Chairmen

SIXTEEN STANDING committees and six task groups have been set up by the Sheet Metal Contractors' National Association, Inc. Chairmen of the standing committees, appointed by A. J. Sabathne, president, are as follows: advisory board of chapter representatives, Angelo Hoffmann; special activities fund, E. B. Brown, Jr.; national affairs, Clarence J. Meyer; business management, Dee Cramer; cost and estimating, Charles DeLaughter; apprentice training, Frank Kramer; sheet metal manuals, W. J. Perkinson; warm air heating and cooling, C. A. Pfahl; accident compensation and unemployment insurance, Richard Friday; contractor insurance, James Welch; sheet metal fabricators, Roland Biersach; duct construction manual, Paul Stromberg. W. A. Kuechenberg is chairman of the labor relations steering committee and the labor relations adjustment committee. John F. Creegan has been appointed chairman of the labor relations state councils committee, and Richard E. Walsh is chairman of the labor relations group insurance committee.

Task groups have been set up to work with the National Roofing Contractors Association and the Heating, Piping and Air Conditioning Contractors National Association. Chairman of the roofing group is Harold Heyse, and Louis L. Narowetz is chairman of the HPACCNA group. Other task groups and their chairmen include: chapter constitutions, Nat Leas; out of town work, W. A. Wiedemann; and code of ethics, Angelo Hoffmann.

April 27, 28, and 29 have been selected as the dates of the association's 1955 annual convention. It will be held at the Mark Hopkins Hotel, San Francisco.

New Mailing Regulations

NEW POSTAL regulations relating to the handling of magazines carrying obsolete addresses may result in considerable delay in delivery. If you are moving, it is important that you let us know your new address — including your new local delivery zone — as soon as possible in order to be sure of receiving all issues of *American Artisan* promptly. Deadline is the 18th of the month preceding date of issue.

Midyear Decline in Construction

CONSTRUCTION contract commitments made in the 37 states east of the Rockies during the month of June totaled \$1,210,509,000, according to F. W. Dodge Corp. This was 25 per cent less than May and 19 per cent below June 1952. Commenting on the June figures, Thomas S.

Holden, vice chairman, said, "This slowdown may possibly continue through the remainder of 1953 and even into early 1954; however, the pressure of rapidly increasing population and the momentum of economic expansion are likely to become dominant in a new uptrend after a relatively brief market correction."

The non-residential total for the first six months of this year was up 9 per cent over the same period for 1952. Residential building awards, totaling \$3,258,496,000, were down 3 per cent. June 1953 residential awards, totaling \$463,084,000, were 27 per cent less than May and 20 per cent less than June of last year.

Room Cooler Sales Up 215 Per Cent

MANUFACTURERS' SHIPMENTS of room air conditioners for the first half of 1953 indicate an increase of 215 per cent over the same period of 1952, according to the Air-Conditioning and Refrigeration Institute. It is estimated that 1953 shipments will exceed one million units, as compared with 365,451 shipped in 1952.

1760 Graduates of NWAHACA Courses

THE SOUTH BEND school was the last in the series of indoor comfort conferences held during the first half of 1953. A total of 1760 heating men attended the 25 schools held during that period.

Housing Figures Aid in Marketing

THE MONTHLY REPORT, *New Dwelling Units Authorized by Local Building Permits*, issued by the U. S. Labor Department's Bureau of Labor Statistics, presents information of importance to those interested in local house building and the market for housing materials and equipment. The report is useful in answering a variety of marketing questions, such as: How much new housebuilding is taking place in individual metropolitan and non-metropolitan areas, townships, and counties? How does activity compare between the central city and the suburbs of metropolitan areas? Is house building keeping pace with general economic and population growth?

Almost 6000 local building-permit officials cooperate with the BLS in compiling the report. Currently, the Bureau's coverage on dwelling units authorized by building permits includes places accounting for 75 per cent of the total U. S. non-farm population.

Examples of some of the kinds of information to be

WHAT'S HAPPENING —

(Continued from preceding page)

gained from the publications issued so far are: In the San Diego area, there was a 64 per cent gain in 1952 over the 1950 previous record for dwelling unit authorizations; a moderate 1952 upturn in the Cleveland area failed to bring the year's activity to 1950 levels; and housebuilding in the Baltimore, Boston, Richmond, and Rochester metropolitan areas declined steadily from 1950 to 1952. The BLS reports indicate that 1950-52 changes in activity generally were more pronounced in the central city, but suburban places accounted for the greater proportion of dwelling units authorized for construction within metropolitan areas.

Copies of the BLS reports showing local dwelling unit authorizations annually for 1950, 1951, and 1952, and monthly for 1952-53 are available free upon request to the Bureau of Labor Statistics, U. S. Department of Labor, Washington 25, D. C.

FHA Tests New House Trade-in Plan

FHA EXPERIMENTS in the trade-in house field, in six test cities, may prove beneficial to home builders and make it easier for families who already own a house to trade one in on a new house better suited to their needs, according to Commissioner Guy T. O. Hollyday of the Federal Housing Administration. Four out of every 10 prospective home purchasers already own a house, and it is for this segment of the housing market that the FHA is testing out the possible effective use of the insured mortgage plan in connection with trade-ins.

There is nothing new in the idea of trading in one house as part payment for another. What is new is the type of transaction now under discussion and the emphasis placed on reconditioning the trade-in property before offering it for resale or rent.

Proposed improvements may be financed with the proceeds of an FHA Title I insured property improvement loan (up to \$2500 on a single-family home), which can be paid off when the house is sold. Mr. Hollyday says that transactions such as these will not only prolong the useful life of the property, but will increase the marketability of the traded-in house to those who want a new home but cannot finance one.

Home Air Conditioning Sweeps Country

"THIS YEAR will likely go down in history as the year that brought climate-control to the American home. Just as central heating created a revolution in home comfort 75 years ago, so is air conditioning sweeping the country in a boom that promises to make it one of our biggest industries."

These observations appeared in a featured article, *Air-Conditioning for Every Home*, by Norman Carlisle, in the August issue of *Coronet*.

"Millions spent on research since World War II," said

Mr. Carlisle, "have paid off with a variety of devices that have jumped out of the laboratory stage into mass production with unexpected swiftness."

Mr. Carlisle estimates that last year Americans handed out more than \$250,000,000 to have air conditioning in their homes, and that this year the industry expects to more than double its 1952 record production of room units. Moreover, the industry can count on installing whole-house systems in at least 50,000 homes, of which 30,000 will be new ones.

"With all its benefits," concluded Mr. Carlisle, "there is no doubt that home air conditioning is becoming one of the big industries of the '50's. Even if it didn't make you healthier and give you a better home to live in, it would be bound to keep right on growing on the strength of its ability to provide just plain cool comfort."

BCR Builds New Laboratory

AN INDUSTRY-OPERATED laboratory is being constructed in Columbus, Ohio, to house certain activities of the general program of Bituminous Coal Research, Inc. The new laboratory will have 10,000 sq ft of floor space and will house the Columbus engineering staff and laboratory equipment. The administration headquarters of BCR will continue in Pittsburgh, including research on chemical process uses of coal, markets, and the handling of BCR publications.

The BCR board of directors authorized the construction of the Columbus facilities to make the most effective use of research funds and personnel there until a larger research program can be activated.

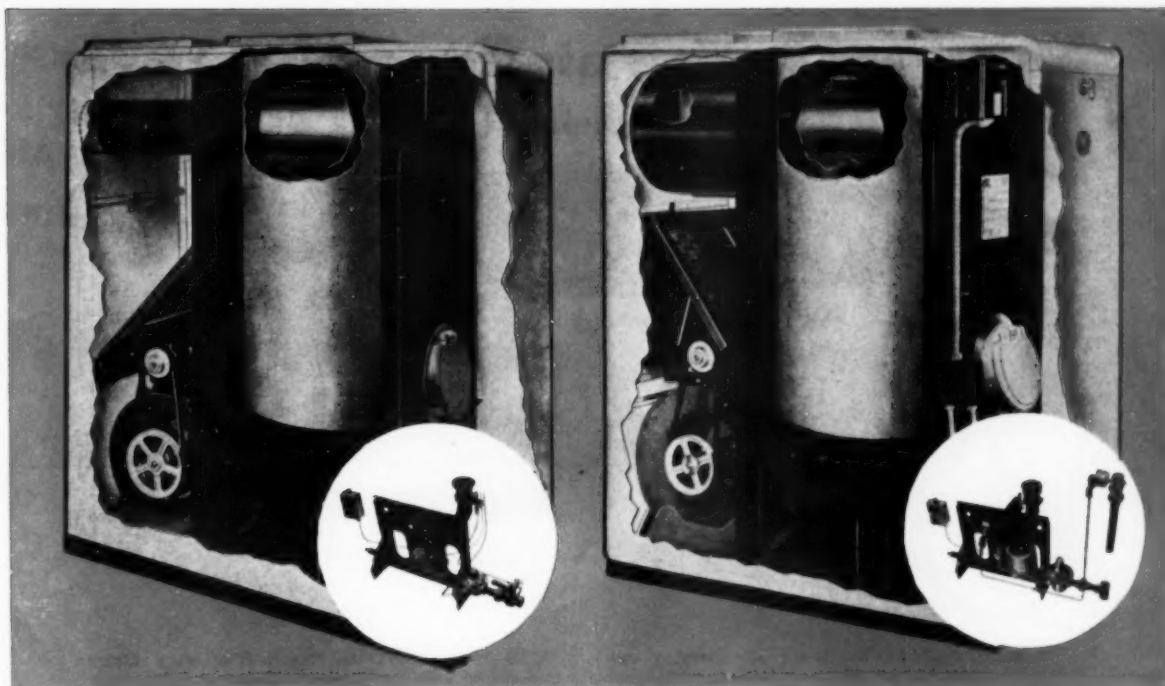
Plan NWAHACA Convention Program

THE PROGRAM for the 40th annual convention of the National Warm Air Heating and Air Conditioning Association, scheduled to be held December 2 and 3 at the Hotel Cleveland, Cleveland, is being planned under the direction of M. I. Levy. F. P. Gibbons is chairman of the entertainment committee. Committee and trustees' meetings are scheduled to take place on November 30 and December 1.

\$4 Billion for Gas Facilities

THE GAS UTILITY and pipe line industry will spend almost \$4 billion for construction of new facilities and expansion of present plants during the four years from 1953 through 1956, the American Gas Association reports. This compares with construction expenditures of about \$4.7 billion in the four years 1949-1952. (The association's estimates presently cover a four-year period to coordinate with other AGA studies).

About \$1.9 billion of the proposed expenditure will be spent on transmission facilities, and \$1.4 billion will go for distribution expenditures. The remaining \$637 million of the total is to be spent for production, underground storage and general facilities.



Richmond AS12-G—Ideal for small homes. A.G.A. input of 90,000 BTU/Hr.

ONE BASIC GAS BURNER
Different control combinations adapt this gas burner for either size of furnace, any type of gas, sea level or high altitude.

Richmond AS23-G—Built for medium-size homes. A.G.A. input of 115,000 BTU/Hr.

Available Now Two Steel Gas-fired Winter Air Conditioners by **RICHMOND**

These two Richmond gas-fired...steel...winter air conditioners are identical in their fine engineering features. Two sizes... AS12-G—90,000 BTU/Hr. input... AS23-G—115,000 BTU/Hr. input... cover most heating requirements. Study these quality features:

A. G. A. APPROVAL—both units are fully approved by the American Gas Association.

HEAT EXCHANGER made of heavy 12-gauge steel for maximum durability. All seams welded full length. Transmits heat quickly and efficiently to circulating air.

BURNER AND CONTROLS are easily removed for service. Mounting plate is held securely in place with four nuts permitting quick removal.

WHITE JACKET of rugged steel construction, streamlined and rounded at the corners. Finished in lustrous white enamel, baked on for long life.



RICHMOND

RICHMOND RADIATOR CO.—AFFILIATE OF REYNOLDS METALS CO.

See your dealer or Write Company Today

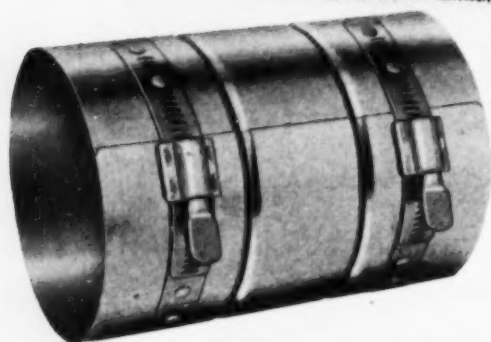
Richmond Radiator Company AA/9
P.O. Box 111, Metuchen, New Jersey
Please send me full information on the Richmond steel, gas-fired winter air conditioners, AS12-G and AS23-G.

Name.....
Company.....
Address.....

No crimps to slow air flow with *New* JENKINS PIPE and CONNECTOR

Perimeter
Gravity
Forced Air
Ventilating

- ★ Faster installations—
- ★ Neater finished jobs—
- ★ More profits to you



Jenkins TITE-AIRE Pipe Connector

*Patented

• **GREATER CAPACITY**—Better air carrying capacity ... because no crimping is necessary! Just insert pipes in each end of Connector and tighten two thumb screws. Every run handles its full capacity. No seals required—surpasses most stringent specifications. Ideal for all jobs, this Jenkins Tite-Aire Connector solves many problems of perimeter heating installation.

CUTS INSTALLATION TIME—You work faster and easier with the Tite-Aire Connectors. No drilling, no screws, no paper, no paste, no wire. Self-aligning. Connect tubing of sheet metal, plastic, fiber, asbestos, flexible steel or aluminum. From 4" up to 100" sizes, in aluminum, galvanized, heavy gage steel, copper and monel. Shipped ready to use, 24 in a carton, with or without damper.

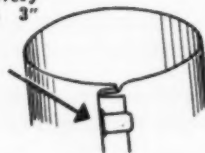
• **EASY ASSEMBLY — STORES NESTED**—Jenkins Speed-Lok Pipe is compactly stored in your shop nested in 5' lengths. Aluminum or galvanized, from 4" up to 36" sizes. No tools! Close seams with your hands and bend over tabs with your finger. Rigid, positive lock. Won't break if you cut it. Makes a neat, rigid run ... without wires.

Jenkins SPEED-LOK® Pipe

Male seam is permanently locked into female slot by a tab every 6". First tab is 3" from end.

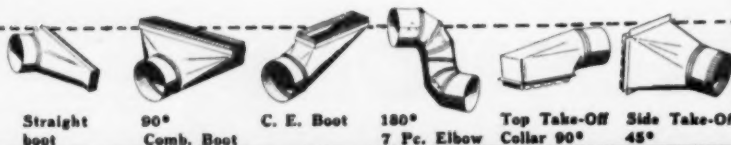


Assemble 20' of Speed-Lok Pipe, ready to install, in a minute. Four 5' sections in photo are locked rigidly by 3 Tite-Aire Connectors. No distortion.



Let us prove that you can quote the same price but earn more per job. Write for Bulletin JTA 53-AA.

A complete line of matching accessories and perimeter fittings



Straight boot

90° Comb. Boot

C. E. Boot

180° 7 Pc. Elbow

Top Take-Off Collar 90°

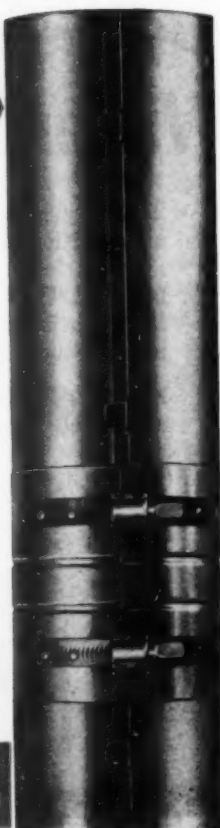
Side Take-Off 45°

RALPH MANUFACTURING CO. INC.

P. O. Box 188

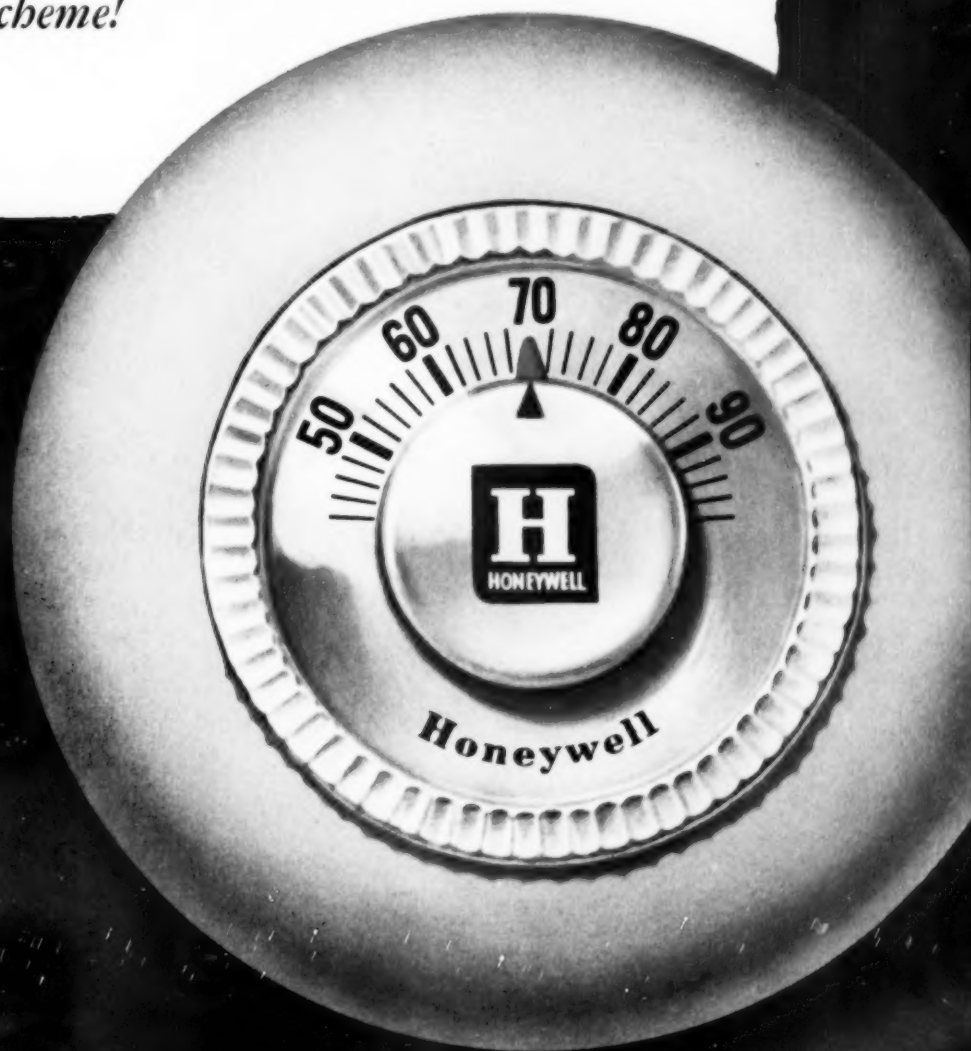
Wadsworth, Ohio

Makers of Jenkins
Furnace Pipe & Fittings



Introducing
the
Honeywell Round

*The completely new thermostat that matches
any color scheme!*



Outmodes all others!

This ad will tell the story in **POST, LIFE,**



Cover ring snaps off for decorating

The "decorator ring" is easy for any housewife to remove. After painting, she snaps it back on—with no trouble at all. A fascinating new sales feature.



Ring snaps off for decorating

A modest pull is all it takes to remove the cover of the Honeywell Round. Long-life spring steel clips hold it firmly in place when you snap it on again.

Easy to paint in any color

The decorator ring comes in a beautiful silver-bronze finish, yet the color may be changed to match the color scheme of the room with but two minutes brushwork by the homeowner. No special paints are required.



A new improved thermostat



It's easy to paint

In just a few minutes the silver-bronze plastic cover can be easily painted to match your color scheme. No special paints are required.

Low-priced for mass sale

A brand new item with low price to give it mass appeal. Its attractive design, featured by national advertising, sets up an immense modernization market.



Actual size 3 1/4" diameter

New, more visible dial and temperature indicators make settings easier. The Honeywell Round is available through any heating dealer.

\$12⁸⁰

plus small installation cost

*A base plate (not shown) is also available at slight extra cost to cover hole left by old-fashioned installers.

BETTER HOMES *and* AMERICAN HOME!



that matches any color scheme—

the Honeywell Round

Here it is—the first really new idea in thermostats in years.

It's now available—through your heating dealer—to replace the old-fashioned thermostat on your living room wall.

Different from any thermostat you've ever seen, its pleasing round lines lend themselves to any decorating plan. The snap-off cover of the Honeywell Round makes it easy to paint the silver-bronze cover to match any decorating scheme. This means you can paint it to blend with any wall.

And there are real improvements *inside* the Honeywell Round—engineering improvements that give greater comfort by cutting down see-saw temperatures, an enclosed, dust-free mercury switch to lower maintenance costs.

What's it cost to replace your old-fashioned thermostat with the Honeywell Round? Only \$12.80, plus installation cost.*

When's a good time to have the installation made? When you're decorating or having the furnace checked. But there's no need to wait for a special occasion. Your Honeywell Round can be installed any time in a few minutes, with no mess or fuss.

So why not call your heating dealer and have him show you the new Honeywell Round—the new model thermostat that's made other manual thermostats obsolete.

Has appeal for all home owners

Graceful, curved lines and ease-of-painting appeal both to owners of luxury houses and owners of modest homes. Every progressive homeowner will want the "new look" in thermostats for his home.

Designed by Henry Dreyfuss

Credit for the "new model" appearance of the Honeywell Round goes to famous designer Henry Dreyfuss. The Dreyfuss name is known and helps create mass appeal.

Designed by Henry Dreyfuss



Credit for the "new model" appearance of the Honeywell Round goes to designer Henry Dreyfuss. Known around the world for his work in design, Mr. Dreyfuss spent many months in research and design development for the new thermostat. The final result, as seen above, was a thermostat wonderfully different, completely modern.

MINNEAPOLIS Honeywell



First in Controls

Another great, new profit opportunity for every Minneapolis-Honeywell dealer

Watch for this colorful ad to appear in
Post, October 31; Life, November 9; American Home,
November; and Better Homes & Gardens, November.

For technical data see the next page

The new Honeywell Round

—a thermostat with sound selling features

New!

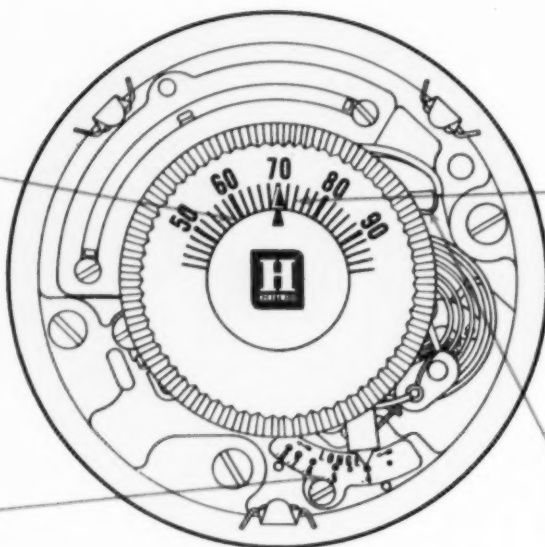
easy-to-read dial

Setting, reading, and checking of performance are simplified by the combination dial. The same scale serves for both the thermometer and the thermostat setting.

New!

adjustable heater

Featured in this new thermostat is a heater which is adjustable to the current characteristics of the primary control. It can be set to operate the burner in the timed cycles needed for constant delivery of heat and good temperature control.



New!

bimetal thermometer

You and your customer will both appreciate this feature. No more "split indicator column" to plague either one of you.

New!

mercury switch

A non-magnetic mercury switch, actuated by the coiled bimetal element, gives positive, quick make-and-break switching. No more service calls to clean dirty contacts.

Clear your old stock now

Within the near future the Honeywell Round will become available through your regular supplier. Now is the time to move your present stock and clear the decks for *action*—the biggest action in the thermostat market in years.

Consumer ads in four national magazines in November, with a combined circulation of well over sixteen million, will direct homeowners to you.

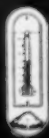
Lay your plans carefully—clear your present stock—estimate your future requirements—for the most dramatic thermostat to appear in the home-heating market in years: the HONEYWELL ROUND.



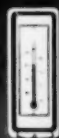
1879



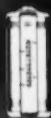
1913



1918



1923



1935



1953

MINNEAPOLIS
Honeywell



First in Controls

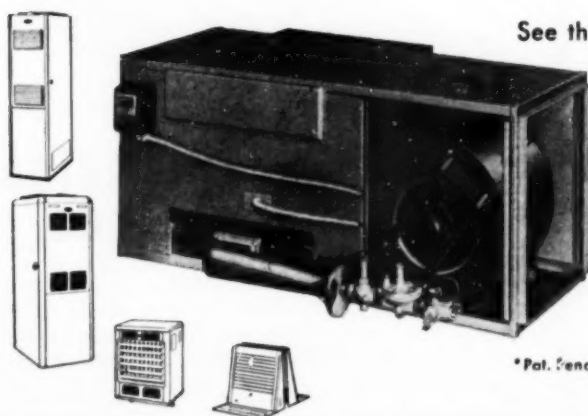


UTILITY'S NEW HORIZONTAL FORCED AIR FURNACES

Here are the ideal forced air furnaces for small home installations. They fit into an attic, under the house or any compact out-of-the-way place to save precious floor space. Easy to install and low in cost, Utility Horizontal Forced Air Furnaces meet competitive conditions on the job.

Equipped with Utility's variable speed

Dy-Rekt* Drive Blower these units provide quiet, efficient heating operation because motor shaft and blower wheel shaft are one and the same. No pulleys or belts. Automatic controls, trouble-free operation, fewer service call-backs. For large home heating at small home cost, select Utility Horizontal Forced Air Furnaces. AGA approved.



See the complete UTILITY heating line now



UTILITY APPLIANCE CORP.
4851 S. Alameda St., Los Angeles 58, Calif.

Manufacturers of Gaffers & Sattler and Occidental Automatic
Gas Ranges • Utility Automatic Gas Heating Equipment
Utility Air Coolers and Blowers

UTILITY APPLIANCE CORP., Dept. AA9
4851 S. Alameda St., Los Angeles 58, Calif.

Please send me free information on:

- ☐ Utility Automatic Heating Equipment
☐ Utility Cooling Equipment

Name _____

Address _____

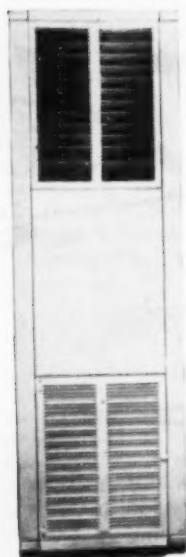
City _____ Zone _____ State _____



HEATMAKERS

for All

DOMESTIC HEATING NEEDS



WALL HEATER

John Zink's new WH-25 Recessed Wall Heater fits standard 2" x 4" stud partitions on 16" stud centers, is barely 58" high. Attractive modern design and finish. Available in standard and radiant styles.

CENTRAL HEATER

John Zink Central Gas Heaters are available in Vertical or Horizontal Forced air models. Suitable for installation in attic, closet, basement, utility room, under the floor, or as a suspended heater. Attractively finished. Complete, packaged unit. HB-65, HBD-65, HBD-80, HB-100, HBD-100 & HB 130 Heaters



FLOOR FURNACE

John Zink Gas Fired floor furnaces are available in 5 conventional and short models with input ratings from 30,000 b.t.u./hr. to 85,000 b.t.u./hr. When equipped with safety pilot and automatic temperature control they are a complete heating plant in a package. A.G.A. approved.

STREAMLINED



CONVERSION BURNER

Easy to install. Operates manually or automatically. Burns clean fuel — natural, mixed, manufactured or LP gases — without soot or smoke. Four sizes available for either vertical or horizontal firing.

JOHN ZINK COMPANY

3401 SOUTH PEORIA

TEL. 16 OKLAHOMA



Arnold Kruckman's Washington Letter

More Sheet Metal Work Needed on Farms

THE SHEET METAL MAN can — and will — be doing considerably more work in rural areas. This prediction is based on information gathered from the U. S. Department of Agriculture and other Government sources.

It appears that though the farmer this season is buying appreciably fewer tractors than he purchased in previous years and is exercising restraint in planning for larger home and farm installations, he is taking the opportunity to make repairs and to rehabilitate both in the home and in farm buildings. He is taking care of construction details that for some reason have been neglected during the long period of prosperity.

For instance, he has found that there is considerable sheet metal work that can be done in the farm's furnace room, and he can use sheet metal work in the heated brood hovers. Ducts and other transmission facilities are now "ripe" for improvements and repairs in these installations. Similar sheet metal improvements are suggested in the pig brooders, a very important and frequently extensive part of the farm system.

Ventilating Systems Needed

We were told that many farmers are turning their thoughts to more extensive ventilating systems in their dairy barns. While most ventilation systems are prefabricated by makers of barn equipment, there may be some on-the-job sheet metal work needed for installation. Ventilation, also, is an important factor in the structures devoted to grain storage. The Commodity Credit Corp. recently has been contracting for a large number of prefabricated grain ventilating units, including both perforated and non-perforated tubes. These are used in aerating stored grain.

John H. Davis, Assistant Secretary of Agriculture and the head of the Commodity Credit Corp., has been travelling through the country telling the farmers and the farm teachers about these applications, and has

authorized the purchase of a large number of grain bins, which may be either lined or made with sheet metal. There seems to be a great deal of interest in the use of sheet aluminum as well as sheet copper for agricultural needs. Various ideas along these lines were discussed at the 34th Annual Conference for Teachers of Vocational Agriculture at the Michigan State College in East Lansing late in July. They also were of interest to the Iowa Beef Producers Association at Cedar Rapids, where Mr. Davis spoke.

There is a considerable need for air ducts in the grain-drying bins. Commercial storages handling corn, wheat, oats and cotton seed meal, likewise use the protective ductwork for the same purposes. It is suggested there is potential need for what the sheet metal industry supplies among those who operate cotton seed oil mills.

Sheet Metal for Livestock

The 432 counties designated by the President as drought-disaster areas, in seven states, have some needs of a similar kind. All these counties have local committees which recommend loans to those who have been hard hit. These loans particularly are made where the livestock operators have been hurt. One great need would seem to be installations to aid in stock watering. There is also a demand for sheet metal lining for feed storage in barns to protect the contents of the bins from rodents and insects. Other needs include vats and other containers for the dipping, spraying and washing of cattle, to eradicate and control the insects that infest them.

It is significant for the sheet metal industry that as of June 1, 1953, 614,955,000 young chickens had been raised on farms in the United States (according to the latest estimate). It is estimated that the number of young chickens raised during all of 1953 will be in the neighborhood of 1.5 billion. Much of the brooding,



Washington Letter

feeding, and watering equipment is built of sheet metal. In addition, heat distribution systems in poultry hatcheries may require ducts made of metal. There is also a growing use of sheet metal egg coolers. These are only a few of the uses to which metal can be put in connection with chicken and egg production.

The suggestion was made that there is a substantial potential market for metal installation among the orange growers and the orange distributing units of California and Arizona. Both states also have specialized commercial enterprises in the growing and marketing of grapefruit.

There also are plans for metal to take the place of some ceramics and wood in communities which take advantage of the national school lunch program. The program operates on a grant-in-aid basis, with state educational agencies responsible for state administration of the funds supplied by the Federal Government. Locally, the program is operated by the schools, and usually receives broad community support. Last year, more than 10 million children, during the school season, daily participated in what the Federal Government regards as the low cost, nutritious noon-day meal.

Many Uses for Metal in Farm Homes

Mrs. Enid Sater Ross, of the Housing and Household Equipment Div., Bureau of Human Nutrition and Home Economics, points out that the rural housewife is very fond of kitchen accessories and clothes drying cabinets — all of which involve sheet metal fabrication. Some farm homes have flour bins in the kitchen which the housewife prefers be made of metal. Some of these bins are built connected to the sinks. The great objective in building the bins, in addition to their service as containers, is to make them impervious to rats and bugs. Many farm wives want cabinets built according to their own specifications. In the farm home tailor-made food driers also are being installed.

There appears to be a switch from wood to metal in almost every conceivable gadget in the house. At the present time the farm homes are taking the opportunity to put new gutters and downspouts on the buildings, and to make various improvements with metal in bathrooms, which are rapidly increasing in the rural homes. It is reported metal containers are used in every possible form and for every possible use, in the kitchen and elsewhere, including special types of waste baskets.

Occasionally, the publications circulated by the division or the bureau among the farm wives suggest ideas for novel adaptation of things used in the homes. Not long ago a certain type of metal bin was suggested for use in the kitchen. Unexpectedly, the division found itself swamped with queries from the women who wanted to know where they could procure the suggested articles. Apparently the best that could be done was to send them a plan which could be followed in ordering the production of the bin. Like women everywhere, farm wives are alert for useful ideas, and novel articles.

Those who wish to make inquiries of Mrs. Ross should address her at the Bureau of Human Nutrition and Home Economics, Div. of Housing and Household Equipment, U. S. Dept. of Agriculture, Washington 25, D. C.

Interest Shown in Steel Panel Construction

Washington is keenly interested in the United States Steel Homes, Inc., undertaking. The new line of steel-constructed homes was shown here.

There was much interest in the basic 4 ft wide modular panel with its new framework and steel sheets enclosing pre-formed mineral fiber insulation. It is said to minimize heat and sound transmission, and to resist fire, to be insect-proof and to resist weather conditions.

SBA Begins Operations

The Small Business Administration has become a legal entity, replacing the Small Defense Plants Administration. The SDPA Administrator, William D. Mitchell, was nominated as SBA Administrator, and his appointment was rapidly approved by the Senate before it adjourned. During the first week of SBA's existence, Mr. Mitchell advised a swarm of small businessmen who urgently applied for loans under the new administration that no applications would be accepted by SBA until October. In October, the SBA will accept applications, and will then go through the procedure of processing them. It is scarcely expected that there will be many loans made until well into the end of the year, or the first of next year.

Neither the Secretary of the Treasury nor most of the other members of the Cabinet look with favor upon the Federal Government as a banking institution. The situation rather concerns the congressmen who wish to establish a means of financial aid for small and inde-

CHEM-O-GLAS

NEW SHATTERPROOF TRANSLUCENT REINFORCED GLASS-FIBER
BUILDING PANELS FOR STRUCTURAL AND DECORATIVE USES WITH
EXCLUSIVE, DISTINCTIVE **RIBBED** DESIGN SO EASY TO INSTALL.

See the new shades — "FROSTED GREEN" and "COPPERGLO" — especially created for patio use where glare and heat are undesirable. Give restful, glare-free light. Heat rays screened out by exclusive new Chem-O-Filter Compound "XO." Also in natural blonde and marbled yellow. Colorful. Colorfast. Virtually indestructible.



CHEM-O-GLAS (pronounced Kem-O-Glass) is precision molded in 8' lengths, 33 1/8" wide, (32" wide from c/c of outside ribs when overlapped.) Some jobber-dealer territories still open.

Hundreds of Uses

No need to paint - or repaint - ever!
"Your first cost is your last cost"



CHEM-O-GLAS UPS SALES — Outdoor showroom of J. A. Eisele Sales, Inc., one of west coast's largest Lincoln-Mercury dealers, showing utilization of CHEM-O-GLAS ribbed structural panels as roofing for structural steel carports.

Everlasting . . . Everlovely . . .

CHEM-O-GLAS is available in flat sheets or the distinctive new RIBBED design. Many architects and builders have found ribbed CHEM-O-GLAS the answer to inside and outside structural and decorative problems where canvas, porcelain, tile, wood, plastic, glass, aluminum or plywood have proved impractical. Inquiries invited.

CUSTOM MOLDING: Manufacturers are invited to submit production problems to us for estimate.

— — — Write for information today — — —

CHEMOLD COMPANY, DEPT. AA-9
2310 Broadway, Santa Monica, Calif.

☐ Send details on CHEM-O-GLAS

NAME _____
FIRM _____
ADDRESS _____
CITY _____

pendent businesses. It is regarded as likely that Congress will have something more to say about it when it comes back, either in special session or at the regular session which begins in January.

Administrator Mitchell has held a series of conferences with bankers, beginning with a number of representatives of the American Bankers Association. He hopes to enlist the aid of the banks in encouraging the development and growth of small business. Apparently Mr. Mitchell regards SBA as a clearing house for all who are concerned with small and independent business. Broadly speaking, SBA seems to be developing along the lines of SDPA, with the added authority to loan money to small business.

Program Proposed for SBA

Mr. Mitchell was scheduled to speak before the recent governors' conference at Seattle. His engagement was, however, cancelled, but before this happened some copies of the address were circulated. His statements broadly outlined the future policies of SBA.

He said that the new agency will use its loan-making powers "to the fullest possible extent" in adherence to the letter and spirit of the limitations imposed upon it. He stressed that federal aid alone is inadequate for a

realistic solution of the problem, and suggested plans similar to those involving the Development Credit Corporations established by the legislatures of a number of New England states. These states, he said, "found a way of getting bankers and other businessmen together to provide financing that banks could not directly undertake." He suggested encouragement of industrial foundations and other community-financed corporations to supplement the customary services of local chambers of commerce and to stimulate new industrial enterprises on a local level.

SBA, during the week of August 3, formally announced its program in detail:

"1. Processing of small business loan applications; intensive effort to arrange local, private financing for small businesses before resorting to use of the funds Congress made available to SBA for making loans.

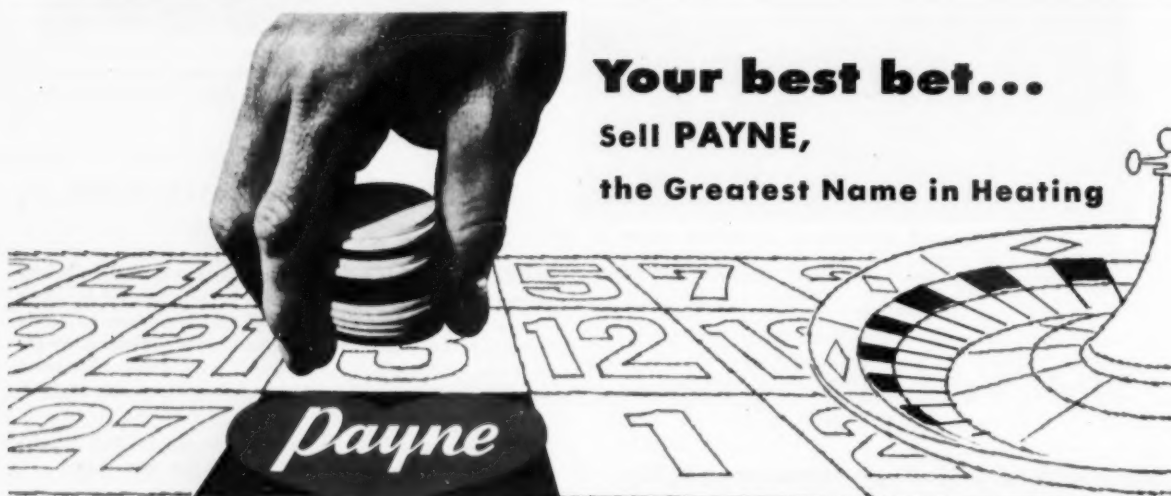
"2. Continuation and improvement of the joint determination program under which nearly \$600 million in military prime contracts has been earmarked for or already awarded to small plants under the joint determination by the military and SDPA.

"3. Continuation of the program started by SDPA under which the agency takes prime contracts itself and sub-contracts the work to small firms.

"4. Co-ordinated effort to obtain tax relief for small business enterprises, thus removing a major obstacle to improvement and expansion of their plants and facilities.

"5. Extension of assistance to small retailers, distributors, mining companies and other non-manufacturers, in line with the requirements in the new law to assist all segments of small business.

"6. Continued high-level consultation with other federal agencies to insure that in all government programs affecting small



Your best bet...
Sell PAYNE,
the Greatest Name in Heating

Only the PAYNE line gives you all these money-making features:

1. Priced right to sell — in tracts, projects, or mansions.
2. Complete new furnace line.
3. Highest profit.
4. Guaranteed quality.
5. Built for easiest installation.
6. Designed for easiest service.
7. Outstanding advertising and sales promotion to back up your selling efforts.

Only PAYNE has the new JETGLAS HEART

...the lifetime heart that never fails! Miracle JETGLAS, first created to protect jet fighter engines against operating temperatures above 1500° F., now protects the heating element of Payne furnaces.

Can't burn out! Can't rust out! Can't wear out!



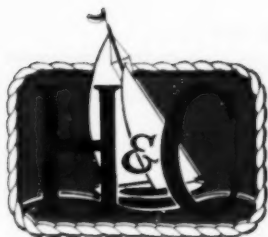
offers a complete new 1953 line of gravity and forced air designs for closet, attic, floor, wall, basement or crawl space installation. For descriptive literature — for the name of your local distributor — write

Payne FURNACE

MONROVIA, CALIFORNIA



A Division of Affiliated Gas Equipment, Inc., Monrovia, Calif.; Cleveland, Ohio; Tyler, Texas; Indianapolis, Indiana

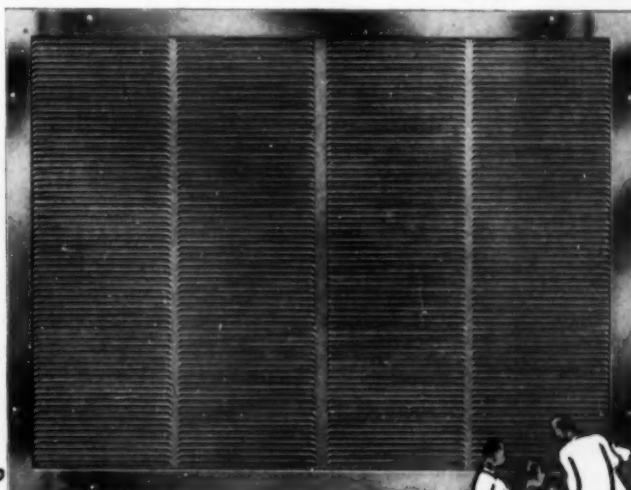


LARGE FIN-TYPE GRILLES

NOW AVAILABLE IN A WIDE RANGE OF SIZES
(UP TO 36" x 36")

Ideal for

**CENTRAL RETURN AIR SYSTEMS
RETURN AIR—
PERIMETER SYSTEMS
COMBUSTION AIR IN UTILITY
ROOMS & CONFINED SPACES
VENTILATION
COOLING SYSTEMS**



No. 740H — FOR HORIZONTAL INSTALLATION
Number of mullions is determined by
width of grille. Size shown is 24 x 18.

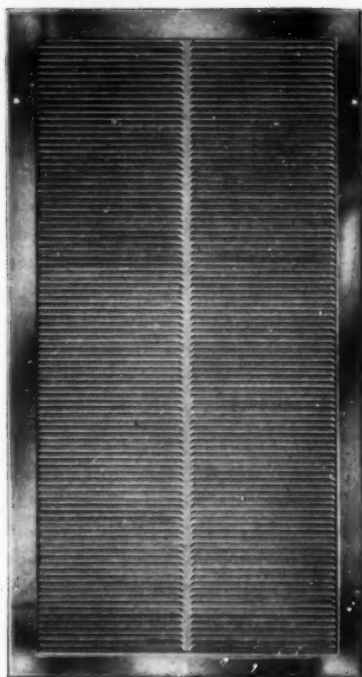


Neat, trim and sturdy with flexible fins of $\frac{1}{4}$ " depth and $\frac{1}{4}$ " mesh, these grilles serve admirably for the majority of return air and ventilation applications in heating and cooling. The setting of the fins, which is at an angle sufficient to largely obstruct sight through the grille and yet provide large free area, adds to their general good appearance.

The 740H series, in which the width of the grille exceeds the height, is for horizontal installation and is available in the following standard sizes:

10, 12, 14, 24, 30 x 10; 12, 14, 18, 24, 30 x 12;
18, 20, 24, 30 x 18; 24 x 24, and in special sizes up to 36 x 36.

The 740V series, for vertical installation, is available in many sizes ranging from 12 x 10 to 36 x 34. In both series the fins are parallel to width of the grille. See these fine items at your H&C Jobber or write for detailed data.



No. 740V — FOR VERTICAL INSTALLATION



HART & COOLEY MANUFACTURING CO.

100 EAST WORTH ST., COLLAMOR, MICH.

20000 Hart & Cooley Manufacturing Co., East Side, Detroit

PRODUCT OF THE WORLD'S LARGEST and MOST PROGRESSIVE PRODUCERS OF REGISTERS and GRILLES

be sure
wall heater installations
comply with
new venting requirements

USE
METALBESTOS
WALL-VENT

Listed and approved by Underwriters' Laboratories, Inc. as a Type B-W gas vent for installation with recessed wall heaters.

The American Gas Association now requires that recessed wall heaters be marked specifying the type of vent to be used. In addition, Underwriters' Laboratories has established a new designation, Type B-W, applying to vents specifically approved for use with recessed wall heaters. Compliance with these requirements will insure better, safer venting and help to eliminate customer complaints resulting from faulty installations.

Write for new folder showing approved method of installing wall heater vents for both new and existing construction. No cost or obligation.

**METALBESTOS WALL-VENT IS
APPROVED FOR INSTALLATION INSIDE
2" X 4" COMBUSTIBLE WALLS**

- No Furring Out Required
- No Extra Insulation Needed

Metalbestos Wall-Vent, the first and leading gas vent specially designed for venting wall heaters, meets all A.G.A. and U.I. requirements. Its insulated double-wall design assures proper venting and protects walls from dangerous overheating. Made of rust-proof aluminum, it resists the corrosive action of vent gases, lasts the lifetime of the house itself.

Send for free copy of

VENT INSTALLATION HANDBOOK

Based on the latest gas venting research, this pocket-size booklet contains complete, up-to-date information on venting practices plus many helpful installation tips. Write today to Dept.

WASHINGTON LETTER —

business the interests and viewpoints of small business will be fully presented.

"7. Enlargement of the program of technical and managerial aids to small business, pursuant to the law's emphasis on this activity.

"8. Strengthening of programs concerned with certificates of competency, defense production pools, sub-contracting, equitable distribution of scarce materials, and an inventory of national production facilities."

It should be stressed that the programs will be carried on by a small, lean organization, devoted to economical operation, with most staff members operating in field offices, near the small businessmen the agency is directed to serve.

Meanwhile the RFC will make whatever loans are made until the first of October; then it goes out of business, and closes several of its field offices. Others, and some of the personnel in Washington, will remain until liquidation is completed at the end of next June.

HHFA to Subsidize 20,000 Low Rent Units

The Housing and Home Finance Administration now has authority to subsidize 20,000 new low-rental units (cut down from 35,000 by the action of the Senate). The House at first could not agree, but finally accepted this figure of 20,000. It is reported that the experience of public housing in Los Angeles had much to do with the loss of interest in the Senate. The Los Angeles undertaking was abandoned because of local opposition, and the Federal Government had to settle \$5 to \$6 million in architect fees and other costs.

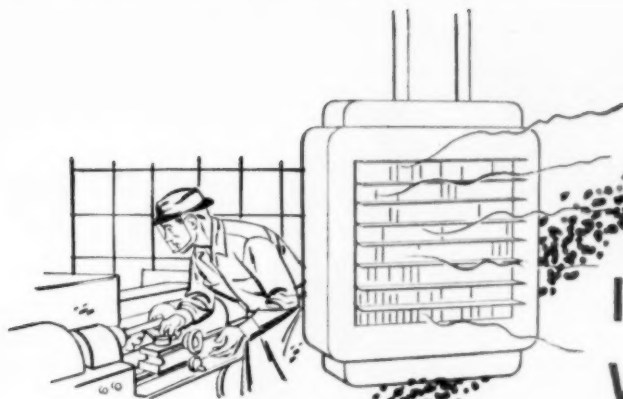
There is a definite move in Washington to revamp the HHFA, particularly to take it out of home building of any kind. Before the next session of Congress, Albert M. Cole, HHFA administrator, will prepare a study which is to give President Eisenhower the information to make essential recommendations. The last report by the Bureau of Labor Statistics states there has been a decline of about 4 per cent in housing starts this year. However, starts exceeded the 100,000-unit June level.

New Agency for Foreign Operations

Twice recently the Indian Government's supply mission in Washington has advertised for bids on sheet metal. The first invitation was issued in June, and the second in late July. The funds for the purchases were made available by the agency that used to be called the Mutual Security Agency or Technical Cooperation Administration, both of which were combined on August 1 under the new name of the Foreign Operations Administration. Harold Stassen is the administrator of the new agency. Its function will be, to all intents and purposes, the same as that of the Mutual Security Agency, with additional authority over the Point Four Program. The agency has about \$12 billion in accumulated funds, and will increasingly diminish its operations in Europe, and expand them in Asia.

METALBESTOS DIVISION

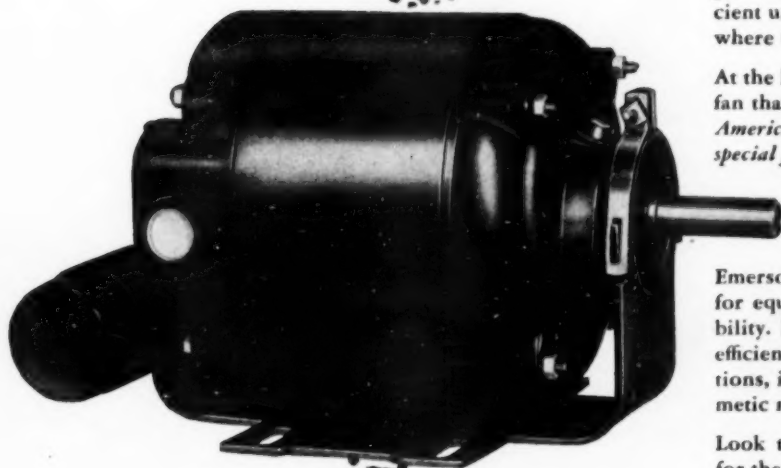
WILLIAM WALLACE COMPANY • BELMONT, CALIF.



It tells heat
where to go!

It would be a cold day in many an industrial plant without modern unit heaters. These efficient units pour out warmth and comfort right where they are needed.

At the heart of each unit is a quiet, dependable fan that sends the heat on its way. *On many of America's best known unit heaters Emerson-Electric special fan-duty motors power the fans.*



Emerson-Electric specializes in building motors for equipment with a reputation for dependability. It has done so for 63 years, and offers efficient motors for a wide variety of applications, in ratings from 1/20 to 5 h.p., and hermetic motors 1/8 to 20 h.p.

Look to Emerson-Electric if you are looking for the right motor to power your product efficiently, dependably. Your inquiry is invited.

THE EMERSON ELECTRIC MFG. CO.

St. Louis 21, Mo.

**EMERSON-ELECTRIC
MOTORS**
**For Belted Fans
and Blowers**



These motors incorporate all the electrical and mechanical specifications best suited for this service. Split-phase motors, available in 1/8, 1/4 and 1/2 h.p., with resilient mountings and automatic reset thermal protectors. For complete data write for Motor Bulletin No. 436.

EMERSON
MOTORS • FANS



ELECTRIC
APPLIANCES



Are you all set for the DUST-STOP filter promotion

starting Sept. 20?

Very soon, Arthur Godfrey will again be telling your customers to replace dirt-clogged filters with new Fiberglas DUST-STOP* Filters. Don't miss your chance to cash in on this most persuasive advertising. Free promotion material is yours for the asking. *If you haven't already ordered your supply, do so today.* Use the coupon below.

*Be sure you have
an adequate supply
of DUST-STOP
filters in
various
sizes!*

Choose from among these
field-tested sales builders

OWENS-CORNING
FIBERGLAS CORPORATION
Department 35-I
Toledo 1, Ohio

Store Window Decal—Colorful, easy-to-apply sign for window or door. Reminds customers of filters. Size: 8½" x 4¾".

Versatile Display—Makes attractive display out of DUST-STOP Filter. Can be used three ways, alone, or as part of larger display.

Store Banner—48" long, brilliantly colored. Eyelets across top for easy hanging in store or in window. Wonderful eye-catcher.

Double Post Card—Mail to your filter customers, prospects. Return-half of card is order for filters.

Four-page Stuffer—Tells why filters need replacing. Space for your imprint or rubber-stamped name and address.

Utility Envelope—Handy 3" x 5" envelope for wrapping small articles. Carries filter story into customers' homes.

Furnace Sticker—Attaches to furnace to remind customer to change filters. Space for your name and address.

Advertising Helps—Newspaper ad mat and radio announcement copy for you to use over your own name.

Please send me the following:

Quantity	Item
_____	D53-18 Store Window Decal
_____	D53-14 Versatile Display
_____	D52-22 Store Banner
_____	D52-20 Utility Envelope
_____	D53-13 Double Post Card
_____	D52-25 4-page Stuffer
_____	D47-7 Furnace Sticker
_____	D53-19 Radio Announcement Folder
_____	D53-16 Newspaper Mat (order only one for each newspaper you advertise in)
_____	D53-20 Filter Size Catalog

NAME _____ CITY _____

ADDRESS _____ STATE _____

MY FILTER SUPPLIER IS: _____

PLEASE PRINT OR TYPE

* FIBERGLAS and DUST-STOP are trade-marks of Owens-Corning Fiberglas Corporation for products made of or with fibers of glass.

new

dealer designed

For the first time, heating dealers now can have a *quality* furnace competitively priced for the mass project market, easy to install, simple to service and unmatched in performance.

Pre-wired and pre-assembled units are shipped to you ready for installation in two packages, the furnace package and the burner package. Once the furnace package is in position, the gas burner package can be completely installed in less than ten minutes. Units shown are designed for 1" clearance sides and rear and the entire furnace can be serviced from the front. The Counterflow unit is only 22 $\frac{1}{4}$ " wide x 18" deep x 72" high and the Hi-Boy unit is only 22 $\frac{1}{4}$ " wide by 27" deep x 65" high. Williamson's high standards of workmanship, quality materials and appearance exist throughout. For details regarding sizes and models available, fill out the coupon below and mail today.



The Williamson Heater Company
3529 Madison Road, Cincinnati 9, Ohio

Gentlemen:

- ☐ Please send me full details regarding sizes and models available in your new dealer designed profit line of furnaces.
- ☐ I am also interested in your two and three ton companion summer air conditioners. Please send me further information.

Name.....Title.....

Firm.....

Street.....

City.....

Zone.....State.....



70,000 BTU (input) COUNTERFLOW MODEL 652-07

THE
WILLIAMSON
HEATER COMPANY

WILLIAMSON

WARM AIR FURNACES



Sell with confidence

(It's Williamson Quality!)

...against competition

(priced right!)

Install with ease

(pre-assembled and pre-wired!)

...and really profit

(even in low-cost housing!)

new

- ★ Pre-wired and Pre-assembled
- ★ Packaged Units
- ★ Ready to install in 10 minutes
- ★ Shipped in only two crates
- ★ Compact—Close Clearance Design
- ★ Quiet Operation
- ★ Optional self-energizing controls
- ★ AGA Approved

WILLIAMSON SUMMER AIR CONDITIONERS

General Offices:

3529 Madison Road, Cincinnati 9, Ohio

Factories:

Cincinnati, Ohio and Madison, Indiana



Williamson two and three ton companion summer air conditioners offer the dealer a double profit. The two packaged installation is simple to install and the installed unit is only 33" wide x 26" deep x 72" high. The hermetically sealed refrigeration unit can be inserted or removed by one man without disturbing the rest of the unit. If service should ever be required simply slide the sealed compressor unit (which is warranted for FIVE years) from cabinet and return to the factory. Write today for further information.

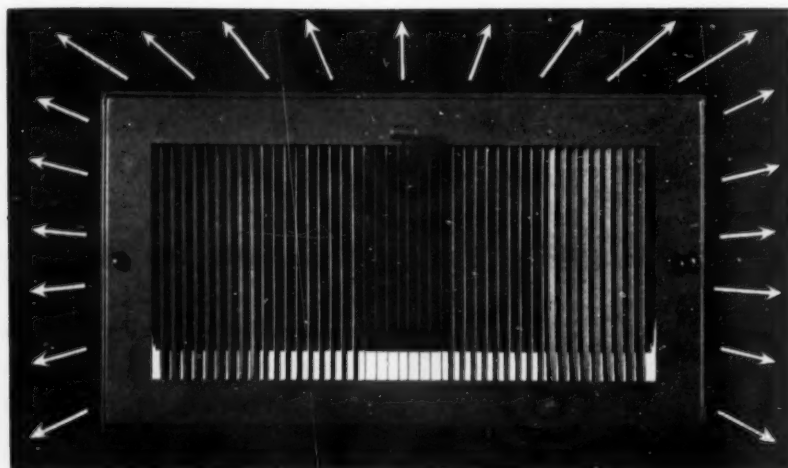


NEW U.S. No. 1356

THE BEST PERFORMER of ALL WALL DIFFUSERS

Spreads the Air Flow — Blankets Outside Walls and Glass Surfaces

**SETS THE NEW STANDARD OF EXCELLENCE AMONG
SIDEWALL DIFFUSERS FOR PERIMETER-SMALL PIPE SYSTEMS**



Registers Should Neither Be "Seen" or Heard

Home owners want comfortable, efficient, quiet, inconspicuous heating systems — which involves registers engineered to diffuse air without noise resistance — in designs that blend almost unseen with the surroundings and room — instead of peculiar patterns that stick out like a sore thumb. U. S. No. 1356 accomplishes all these things.

Has the lowest resistance and best distribution of Air Flow of all Wall Diffuser Registers. Grille-Bars are graduated for Air Flow from 0° Center to 45° Extreme Right and Extreme Left.

All No. 1356 U. S. Diffuser Sidewall Registers are equipped with Set-Lock attachment to lock damper in any desired fixed position to achieve balancing of job at the register.

Offered in sizes for 4", 4½", and 5" round pipe systems — for 6", 7", and 8" Round Pipe Perimeter, Perimeter-Loop, Radial and Radial Loop installations — with baseboard or flat return intakes to match. Ask your U. S. jobber for complete details.

Refer to Catalog No. 53 — or send for your copy — to see the complete line of U. S. Diffusers for Floor, Sidewall, and Out-of-Wall Installations.



UNITED STATES REGISTER COMPANY

BATTLE CREEK, MICHIGAN

MINNEAPOLIS • KANSAS CITY • ALBANY

SOLD BY LEADING JOBBERS FROM COAST TO COAST

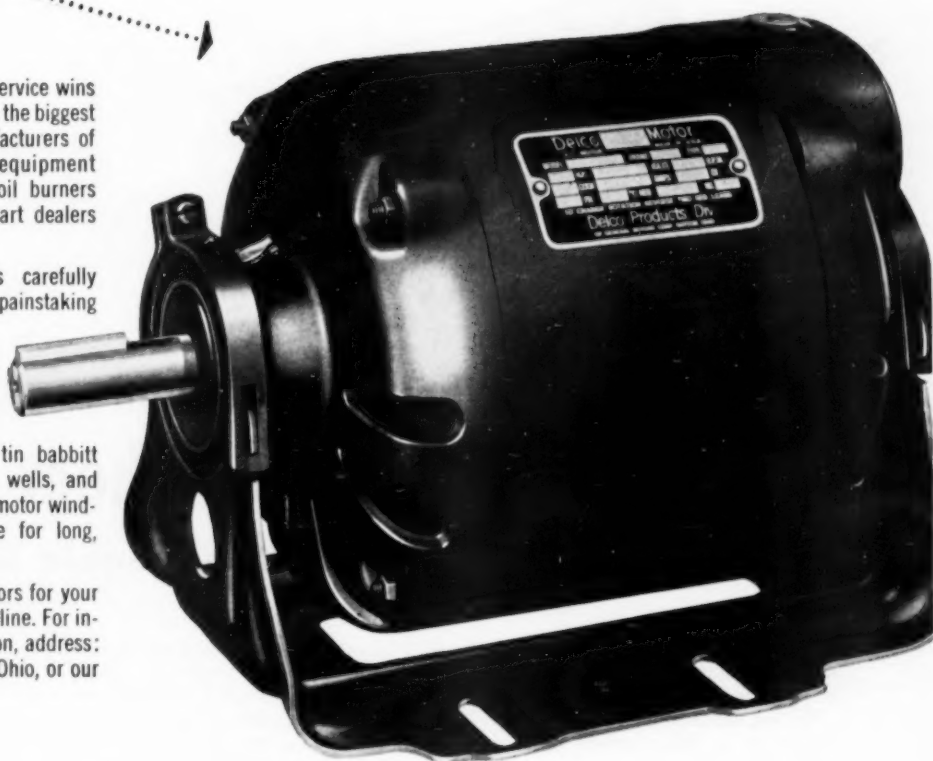
Engineered to WIN CUSTOMERS

Delco Motors

Longer, more dependable service wins more customers. And that is the biggest reason why leading manufacturers of heating and ventilating equipment choose Delco motors for oil burners and blowers . . . why smart dealers replace with Delco.

Delco selects materials carefully and builds its motors with painstaking attention to every detail. Delco motors have precise dynamic balance . . . special features such as uniflow pressure-cast rotor conductors, steel backed tin babbitt sleeve bearings, cored oil wells, and varnish-dipped and baked motor windings add extra endurance for long, trouble-free service.

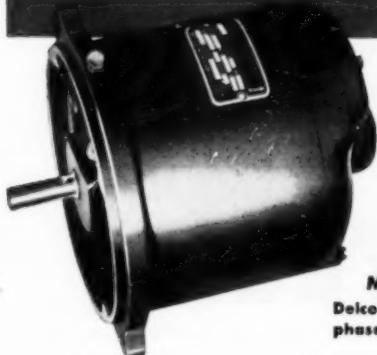
You will find the right motors for your products in the great Delco line. For information on any application, address: Delco Products, Dayton 1, Ohio, or our nearest sales office.



MOTORS FOR BLOWERS

Delco resilient-mounted motors, split-phase and capacitor-start types, single- and two-speed designs, 1/4- to 3/4-horsepower ratings.

THE BEST RUNNING MATE YOUR PRODUCT CAN HAVE



DELCO PRODUCTS

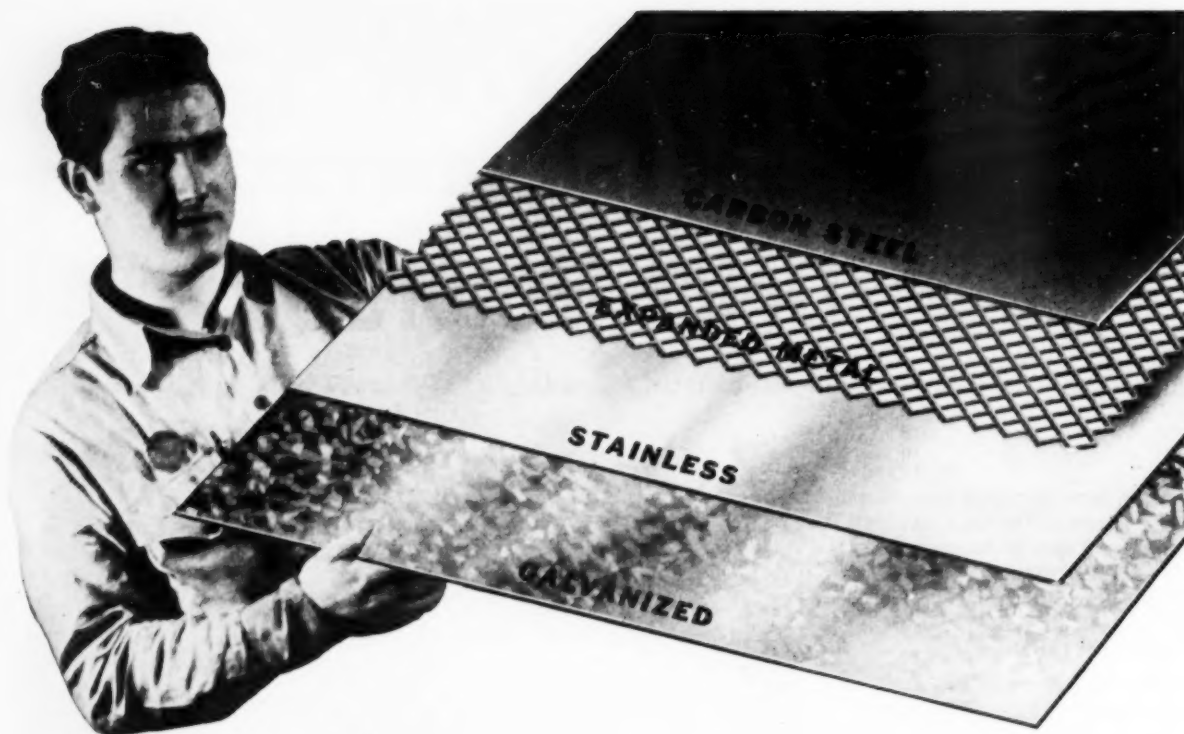
Division of General Motors Corporation • Dayton, Ohio



MOTORS FOR OIL BURNERS

Delco flange-mounted motors, split-phase, 1/4- to 3/4-horsepower ratings.

SALES OFFICES:
ATLANTA • CHICAGO • CINCINNATI • CLEVELAND
DALLAS • DETROIT • HARTFORD • PHILADELPHIA
ST. LOUIS • SAN FRANCISCO



Whether It's Pounds or Tons . . .
Call Ryerson for Sheet Steel
 Improved Stocks . . . Dependable Delivery

We are happy to report that our stocks of sheet metal are now in excellent shape to take care of your every requirement.

In galvanized sheets we can offer you many gauges in a wide variety of pattern sizes or we'll cut to your order. All sheets form readily—all are clean, bright and uniformly coated for greatest protection against corrosion.

Stocks of straight chrome stainless sheets, for which you need no allotment, are also good. This steel usually serves as a satisfactory alternate on jobs where nickel-bearing types are presently restricted. And, as you know, stainless jobs are profitmakers.

In addition, you can now draw on your nearby Ryerson plant for a wide selection of carbon steel sheets—hot and cold rolled and pickled and oiled, as well as Ryex expanded

metal in many gauges and pattern sizes.

And remember, should you ever require assistance in solving any steel problem, our sheet metal specialists will gladly work with you. So call your nearby Ryerson plant the next time you need steel of any kind. You can depend on prompt delivery to meet your work schedule.

PRINCIPAL PRODUCTS

CARBON STEEL BARS—Hot rolled and cold finished

STRUCTURALS—Channels, angles, beams, etc.

PLATES—Many types including Inland 4-Way Safety Plate

SHEETS—Hot and cold rolled, many types and coatings

TUBING—Seamless and welded, mechanical and boiler tubes

ALLOYS—Hot rolled, cold finished, heat treated. Also tool steel

STAINLESS—Stainless bars, plates, sheets, tubes, etc.

BABBITT—Five types, also Ryertex plastic bearings

RYERSON STEEL

JOSEPH T. RYERSON & SON, INC. PLANTS AT: NEW YORK • BOSTON • PHILADELPHIA • CINCINNATI • CLEVELAND • DETROIT
 PITTSBURGH • BUFFALO • CHICAGO • MILWAUKEE • ST. LOUIS • LOS ANGELES • SAN FRANCISCO • SPOKANE • SEATTLE

Improving Public Relations

WITH SUMMER fading into the past, many of the sheet metal contractor and warm air heating dealer associations will once again start holding regular meetings and making plans for their annual conventions. The editor, often a guest at these events, has been asked on several occasions for suggestions on what could be done to develop the effectiveness of the work being carried on by these organizations. Here are a few ideas:

Appoint a public relations committee and assign it the duty of achieving recognition by the local newspapers. The first step in receiving recognition is to prepare a news release both before and immediately after each meeting and to send it to the editor who would handle association activities (often the person in charge of the business section). It is also a good idea for one of the officers of the association to call on and become acquainted with the editor.

Another way to obtain better public relations is through advertising at the local level. Many associations insert a one-half or full page ad telling the public about the benefits of warm air heating and tying in the fact that work done by the companies listed in the ad conforms to the policies and practices recommended by the local association of warm air heating and sheet metal contractors.

Most associations like to have as many members as is practical for their area. They believe that a gradual growth is healthy, that it will mean successful implementation of the principles stated in their by-laws. Therefore, a membership committee is formed. But another committee — the reception committee — can do even more to recruit members. All too frequently the reception committee fails to seek out the visitor at a meeting to see that he not only becomes acquainted with all of the other members but also understands that he is welcome and that his attendance at other meetings will be appreciated. After the meeting has adjourned it is advisable for a member of the reception committee to ask the visitor for his opinion on the subject discussed. This shows him that the association is looking for answers to mutual problems.

Often the officers of an association are men who have been in business for a long time. It is thought that these men are best suited to guide an organization of businessmen. This is good thinking, but a better arrangement would be for the men with this experience to be on the board of governors, where they are in a position to make the policies and supervise the carrying out of such programs as the membership desires. Members with less experience can then assume the responsibilities of the different administrative offices. This will prepare them for eventual membership on the policy making board and will give more members a feeling of participation.

THE FIRST OF THREE proposed sections of a new test code for air cleaners used in general ventilation was adopted by the Air Filter Institute* at its meeting held in Chicago earlier this year. Section I of this code is devoted exclusively to those air filters known to the trade as "panel" or "unit" type filters. This category includes both dry type (sometimes termed strainer type) filters and viscous impingement type filters. Additional sections will be prepared to cover (a) automatic mechanical air filters; and (b) electrostatic precipitators and filters of similar class intended for removal of the discolorating particulate matter from ventilation air.

Objectives of Committee in Formulating the Code

In formulating the AFI code, the committee — guided by years of experience in air filter test work — set down the following points as desirable:

- a) The test procedure should be as practical, direct and uncomplicated as possible.
- b) The test procedure should be clearly specified, should give reproducible results, and should show a clear difference in performance between high quality and low quality filters.

All the Air Passed Through the Filter

One of the most critical aspects of previously accepted test procedures has been the sampling of only a small portion of the air and dust handled by the filter during a test. Any partial sampling procedure requires special technique if results are to be accurate and reproducible. Even with the utmost care, there is always some question regarding the accuracy of methods where only a small percentage of the total air volume is sampled.

Most partial sampling methods require the sampling of no more than 0.05 to 0.10 percent of the total air volume in question. The AFI code, as it pertains to "panel" or "unit" type filters, eliminates entirely the problems and difficulties encountered with partial sampling. This is accomplished by passing all the air through the absolute filter so that

*Members of the Air Filter Institute are: Air Devices, Inc., Air Filter Corp., Air-Maze Corp., American Air Filter Co., Inc., Continental Air Filters, Inc., Dollinger Corp., Drico Industrial Corp., The Farr Co., Owens-Corning Fiberglas Corp., Research Products Corp., Trion, Inc., Wil-son and Co., Inc.

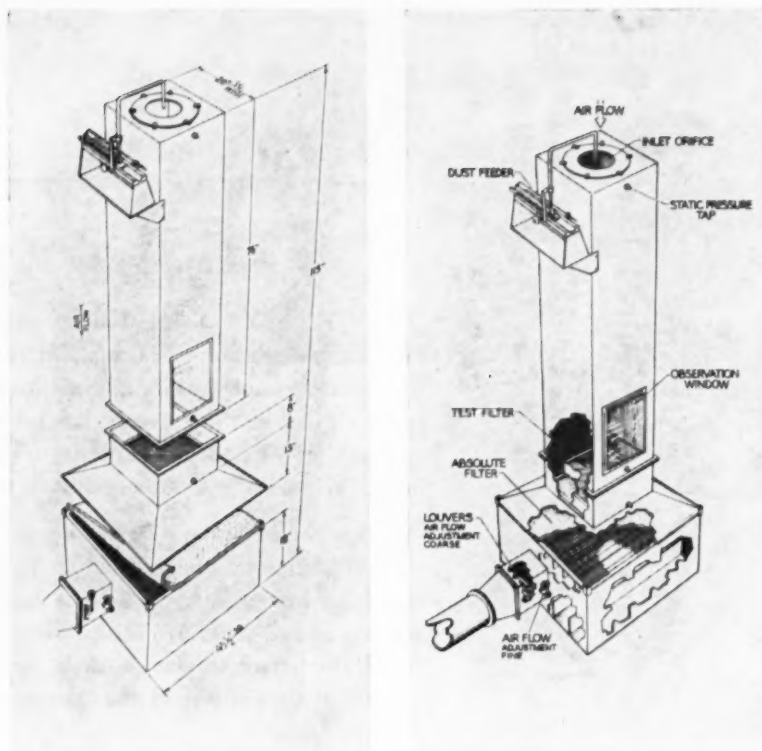


FIG. 1 — FOR TESTING UNIT TYPE FILTERS, the AFI code set-up provides for passing all the air through the absolute filter. Here are cutaway and exploded views of the vertical test duct specified in the code. An alternate horizontal arrangement is specified for those filters not recommended for vertical air flow operation

Here's Detailed Explanation of AFI's

New Air Filter Code

By A. Nutting and R. F. Logsdon

Chief Engineer and Vice President, and
Assistant Director of Research, respectively,
American Air Filter Co., Inc.

The first of three sections of a new test code for air cleaning devices — covering panel or unit air filters — was recently adopted. Objectives, features and procedures of this important code, which provides a basis for the selection of filters, are discussed in this authoritative article

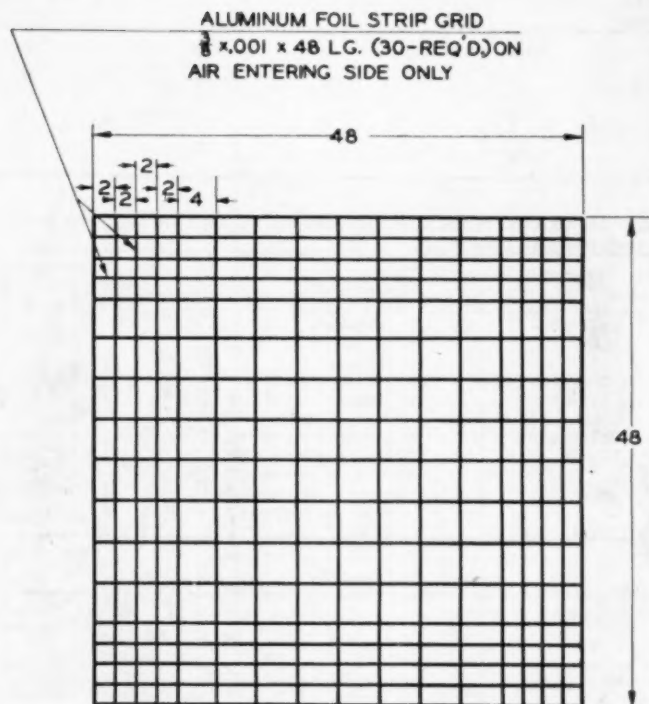


FIG. 2 — THE ABSOLUTE AIR FILTER used in the AFI code set-up has aluminum foil strips for grounding electrostatic charges. The filter is 1/2 in. thick fiber glass. The aluminum foil strip grid is cemented to the filter with Carter's rubber cement mixed with 50 percent benzine

all the dust passing the test filter can be collected and weighed for each efficiency determination.

This procedure also makes it possible to account directly for all the dust that has been fed into the test filter during a performance run. The code specifies that the weight of the dust collected on the absolute filter, plus the weight of dust collected in the test filter, shall equal the weight of dust fed within ± 5 percent. The ability to account for all of the dust serves as proof of the integrity of the system. Partial sampling procedures cannot provide this proof, since only a very small percentage (0.05 to 0.1 percent) of the dust is recovered.

Duct Arrangement for the Test

The duct arrangement is shown in Fig. 1. Air flow is vertically downward entering through a calibrated orifice at the top end of the duct, at which point the dust mixture is injected. The air and dust are thoroughly mixed in the chamber before reaching the test filter, which

is 84 in. from the inlet. The air — along with whatever dust passes the test filter — is drawn into the receiving chamber, and then to the absolute filter where the dust is removed.

How the Efficiency Is Determined

In conducting performance tests, the absolute filter is weighed before and after each dust feeding increment. The weight of dust injected into the system is known, and the efficiency for each increment of dust fed can then be determined by the following equation:

$$E = [1 - (Q_2/Q_1)] \times 100$$

where E = efficiency, percent; Q_1 = weight of dust fed; Q_2 = weight of dust collected on absolute filter.

The code clearly specifies the rate of feeding the dust and the length of time a performance test should be run. The feeding rate is 9.65 grains per 1000 cu ft of air. Efficiency runs must be made at uniform intervals, the maximum interval being 1 hr — except that in no case may less than 10 grams of dust be used for an efficiency run. The per-

formance test is to be continued until such time as either of the following two conditions occurs:

a) Three consecutive arrestance values are less than 85 percent of the peak arrestance.

b) Resistance of the device undergoing test reaches the limit recommended by the manufacturer.

The absolute filter is specified to be no less than 99 percent efficient on the test dust and to be non-hygroscopic. [One accepted material is identified as PF105 Aerocor, 1/2 in. thick, 1/2 lb density, manufactured by Owens-Corning Fiberglas Corp.] The absolute filter is shown in Fig. 2.

The ribbons of aluminum foil are attached in order to ground the static charge collected on the surface of the material during performance tests. Failure to carry away the accumulated charge results in deposition of dust on the adjacent metal duct walls.

One of the most critical elements in air filter testing with synthetic dust is the dust dispersion apparatus. Failure to disperse the dust properly results in high efficiency values, regardless of the type of dust used. The AFI code clearly specifies the feeding equipment, the aspirator system and the feeding procedure.

Data Establishing

Integrity of Method

In developing the AFI test code, one of the first tests made was to determine the quantity of dust collected on the absolute filter with the test filter omitted as compared to the quantity of dust fed. The results of four of such tests are shown in Table 1.

A second set of tests made to establish the integrity of the system determined the weight changes incurred by the absolute filter after periods of rest. Tests were made with and without test dust on the absolute filter. Table 2 shows the results of six such tests.

It may be observed in Table 2 that the greatest weight change encountered under normal laboratory conditions was 0.3 grams. This difference in weight will affect results in percentage points by

$$[(0.3)/(\text{weight of dust fed})] \times 100$$

which represents one percentage point for dust loads of 30 grams, a typical run for an 800 cfm filter.

The integrity of the method may be further illustrated by the test re-

sults on a unit type viscous impingement filter. Table 3 shows the actual test data — including the weight of the absolute filter, resistance of the test filter after each dust load and the efficiency results. Included also in Table 3 are the calculations for dust holding capacity, average arrestance or efficiency and the dust balance check. This data is shown also in Figs. 3 and 4, which are Parts I and II, respectively, of the officially approved AFI report.

It may be observed that the dust balance checks within 1.8 percent of the dust fed. It may also be observed that the absolute filter can be used for several arrestance or efficiency determinations. This reduces the number of weighings, as the final weight for the first run becomes the initial weight for the second run, and also tends to enhance the over-all accuracy of the procedure.

Uniform Reporting of Results

One of the important aims of the AFI code is to specify reporting procedures in such a manner that performance results for similar classes of filters are reported in a uniform manner.

The AFI code places as much emphasis on dust holding capacity, which represents filter life, as it does on arrestance or efficiency. The manner in which dust holding capacity is determined is specified in the code and is listed in tabular form on the performance report.

Provides Basis for Selecting Air Filters

Section I of the AFI code specifies testing equipment, testing procedure and reporting methods of such a nature that the following accomplishments are realized:

a) Means are provided for comparison of arrestance of air filters of the "panel" or "unit" type. The method of reporting makes it possible to compare arrestance at various stages in the life of the filter in question.

b) Rigid specifications are provided for establishing dust holding capacity values, from which values filter life may be estimated.

c) Means are provided for comparison of resistance of various filters at various rates of air flow.

d) Finally, through the above Items (a), (b) and (c) a basis for selection of air filters is provided.

Items (a) and (b) above merit further explanation. With reference

TABLE 1—DUST RECOVERY ON ABSOLUTE FILTER with test filter omitted

Dust fed, grams	Weight of absolute filter, grams		Weight increase of absolute filter, grams	Percent dust recovery
	Initial	Final		
20	185.9	204.0	20.1	100.5
20	195.0	215.5	20.3	101.5
20	189.4	209.3	19.9	99.1
20	215.3	235.5	20.2	101.0

TABLE 2—WEIGHT CHANGE OF ABSOLUTE FILTER after rest periods and after passage of room air

Test No.	Condition of absolute filter	Treatment of absolute filter	Change in weight of absolute filter, grams
1	Loaded with 60 gm AFI dust	At rest overnight in laboratory	+0.3
2	Clean	At rest overnight in laboratory	±0.0
3	Loaded with 80 gm AFI dust	At rest over night in laboratory	±0.0
4	Loaded with 20 gm AFI dust	At rest overnight in laboratory	+0.1
5	Clean	Subjected to 800 cfm air flow, room air, for 20 minutes	+0.1
6	Clean	Subjected to 800 cfm air flow, room air, for 5 minutes	-0.1

TABLE 3—AFI TEST on Filter "X"

Dust fed, grams	Cumulative dust fed, grams	Test filter resistance, in. WG	Absolute filter weight		Dust on absolute filter, grams	Efficiency, percent
			Start	End		
0	0	0.045	—	—	0.0	—
30	30	0.050	199.0	209.8	10.8	64.0
30	60	0.070	209.8	220.2	10.4	65.3
30	90	0.090	194.6	204.4	9.8	67.4
30	120	0.105	204.4	214.1	9.7	67.7
30	150	0.120	214.1	223.1	9.0	70.0
30	180	0.145	185.0	193.1	8.1	73.0
30	210	0.185	193.1	200.8	7.7	74.0
30	240	0.230	200.8	208.4	7.6	74.7
30	270	0.330	190.0	197.0	7.0	76.6
30	300	0.415	197.0	204.2	7.2	76.6
30	330	0.510	204.2	211.0	6.8	77.3

Average efficiency: 71.5 percent.

Total dust fed: 330 grams.

Dust fed to 0.5 in. WG: 326 grams.

Dust holding capacity to 0.5 in. WG: $326 \times 0.715 = 233.1$ grams.

Final weight of filter: 5230 grams.

Initial weight of oiled filter: 5000 grams.

Weight increase of filter: 230 grams.

Dust collected on absolute filter: 94.1 grams.

Total dust recovered: 324.1 grams.

Dust balance = $(-5.9/330) \times 100 = -1.8$ percent.

to the comparison of arrestance, it should be pointed out that the test dust mixture chosen for performance tests is sufficiently severe to give a wide spread in efficiency values between a known high quality filter and one that is known to be of low quality. This choice was a deliberate one, for it is one of the aims of the code to show a clear and distinct difference in air filters having different collectance characteristics. For example, one type of filter of known and accepted high performance characteristics on ventilating air has an efficiency value by the AFI test in the order of 90 percent. At the other end of the scale, commercially available air filters of recognized low quality yield arrestance values as low as 50 to 60 percent.

With reference to judging the life of air filters from performance reports, it is again important to realize that the dust chosen for the performance tests is one that has air filter plugging characteristics not unlike atmospheric dust that exists in urban and industrial areas. *Selection of a test dust for efficiency determinations only is not sufficient, as efficiency is by no means the only factor in evaluating performance.* Loading characteristics of the filter are of equal importance — and these are mainly dependent upon the bulk density of the dust rather than on particle size.

A discussion on this new air filter code — both pro and con — will appear in an early issue.

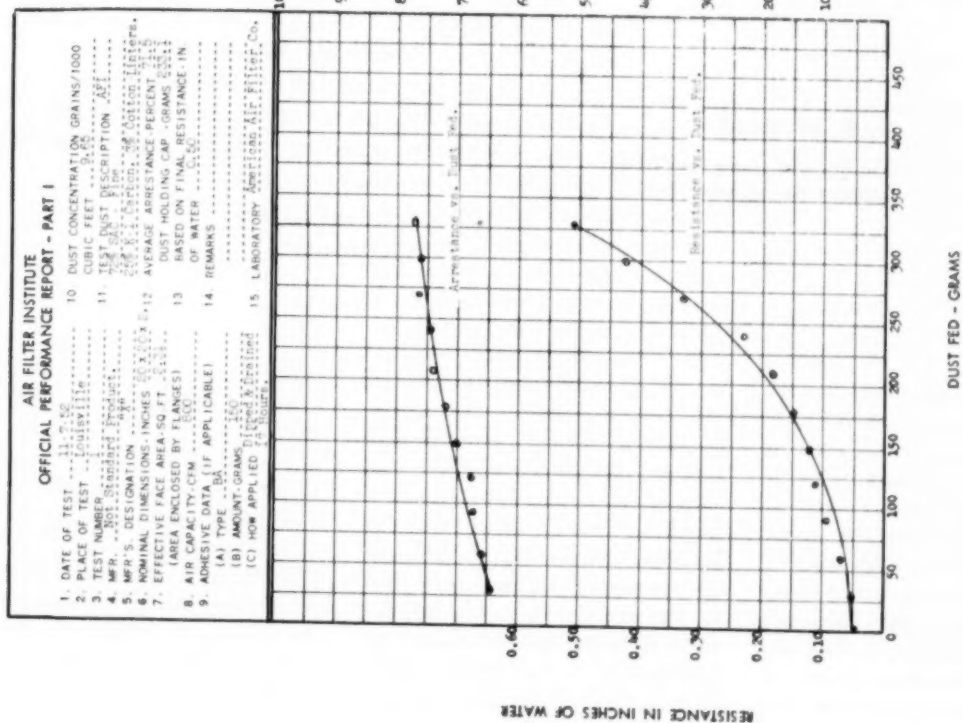


FIG. 3 — PERFORMANCE CURVES AND DATA for test on viscous impingement filter

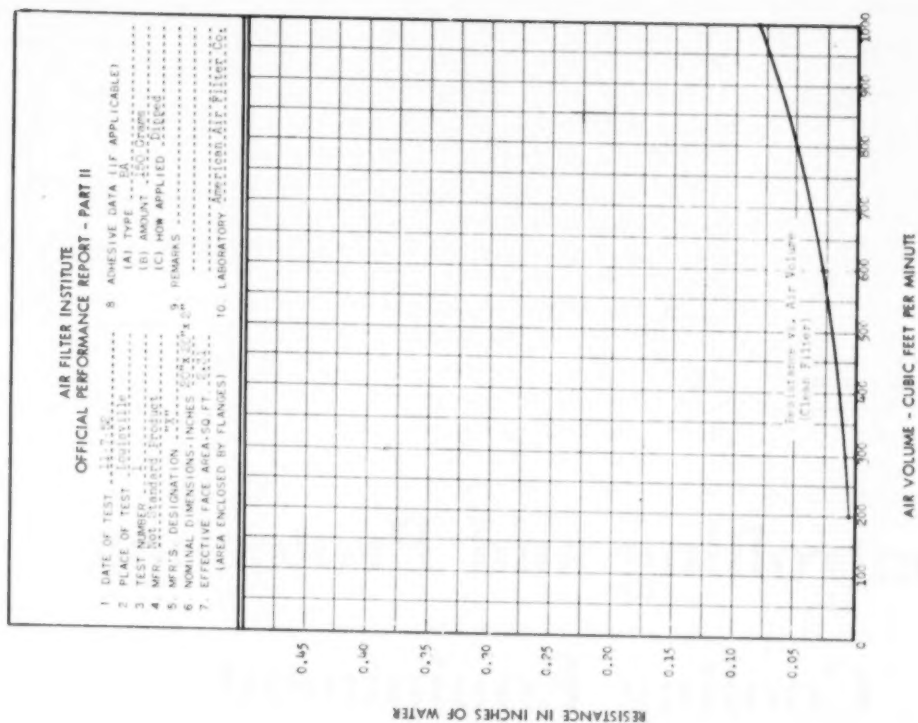
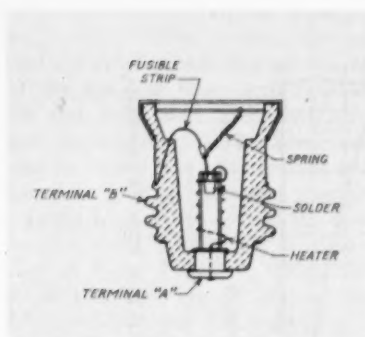
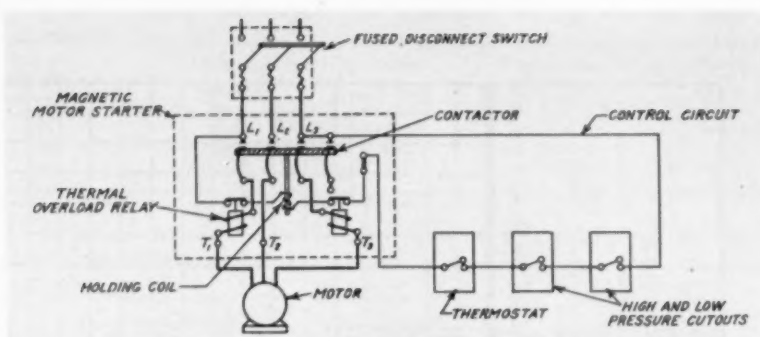


FIG. 4 — PART II OF PERFORMANCE REPORT on Filter "X" showing resistance plotted against air volume



1 THE "FUSETRON" is a protective device for the motor which incorporates a thermal overload cutout. Current flow is from terminal A to terminal B, through the heater and fusible strip



2 THE OVERLOAD RELAYS built into this magnetic motor starter automatically protect motors from sustained abnormal overloads too light to blow fuses

Controlling and Protecting Cooling Equipment

By S. W. Reid

**Air Conditioning Engineer
Gilbert Associates, Inc.**

- circuit breakers
- magnetic starters
- inherent motor protectors
- starting relays and capacitors
- thermostats
- humidistats
- cutouts

WITHOUT RESERVATION, one could name the electric motor as the most important electrical device used in connection with a mechanical cooling system. The electric motor is known, in technical terms, as the prime mover of the system. Its function is to convert electrical energy as received from power lines into mechanical energy needed to drive the compressor. An electric motor is also called upon to provide the mechanical energy needed to drive fans for circulating air and pumps for

circulating cooling water to a tower. The present state of the art of mechanical cooling could not have been reached without a parallel rate of progress in the development of the electric motor.

Certain fundamental facts about electric motors and their application in air conditioning work may be useful to the dealer. First of all, the operation of a mechanical cooling plant at the air conditioning level (as compared to the medium temperature household refrigerator or

the still lower deep freeze level) requires an electric motor capacity of about 1 hp for each ton (12,000 Btu per hr) of cooling. As the operating temperature level drops, the horsepower requirement per ton of cooling increases.

At the air conditioning level it can be expected that the suction side of the compressor will have a pressure corresponding to a temperature of between 40 and 45 F. The discharge side will have a pressure corresponding to about 105 F. As the suction

pressure for a given compressor, running at a given speed, drops (assuming a constant discharge pressure as determined by the condenser water) the horsepower requirement drops as does the capacity. However, the horsepower drops less rapidly than the capacity. Therefore, the horsepower per ton value goes up.

Since a given compressor intended for operation at low suction pressures requires less horsepower than when operated at high pressures, a smaller motor can be used. Dealers should be aware, therefore, that condensing units originally intended for low temperature duty should be checked for proper motor size if they are to be applied to relatively high temperature applications.

Another important consideration in selecting motors for use in driving compressors is the adequacy of the motor starting torque. When a mechanical cooling system is operating, a pressure differential exists across the pistons of the compressor. An electric motor selected for horsepower alone will normally have sufficient operating torque to sustain compressor operation against the normal range of pressure differential. When the compressor is stopped, the pressures equalize in time. Should the compressor be restarted immediately after it has been stopped, however, the motor will need to have enough torque to overcome the pressure differential in addition to the friction and inertia forces. Compressors are not free starting devices as are blowers. They do have a starting torque requirement which must be met by the motor. High and normal starting torque motors are generally used, depending upon compressor characteristics. Low torque motors are rarely if ever used for refrigeration compressors.

It should be pointed out that, with the exception of portable equipment of the room cooler type, all power lines to air conditioning equipment should be brought through a separate fused disconnect switch or circuit breaker. This device is usually required by codes to be within sight of the equipment.

What Controls Must Do

Directly related to the electric motor are three problems which must be considered: how to start and stop the motor by making and breaking the electric power supply to it; how to protect the motor from damage due to overheating caused by severe overloading; and how to automatically sense desired levels of temperature, humidity, or operating pressures and transmit this information to the device which starts and stops the equipment.

The solution to the first problem depends upon the size and type of motor. Motors above 2 hp, whether single, 2, or 3 phase, cannot have their power circuits interrupted directly by the contacts in the sensing devices (temperature, humidity, and pressure controls) because of the high currents and multiple phases. It is necessary to separate the power and control circuits by means of highly specialized relays known as motor starters. Small, single phase motors do not require starters, but can use the contacts in the sensing devices directly, provided they are of ample capacity for both the starting and running currents of the motor.

The solution to the second problem also depends upon the size and type of motor. Large motors which require starters are protected by thermal overload relays in the starters. Small motors are equipped with built in thermal protectors.

The solution to the third problem is simply to select thermostats, humidistats, and pressure controls which have the characteristics and operating limits desired.

Devices and Their Functions

In the paragraphs which follow, a number of the common electrical devices and controls used in air conditioning are discussed in some detail. A tabulation of those covered includes:

1. Fused disconnect switch or circuit breaker. *Function:* Serves as a positive means to break power supply to unit. Fuses or circuit breakers protect power lines and equipment against extremely heavy overloads or direct short circuits.
2. Magnetic motor starter with over-

Air Conditioning Fundamentals

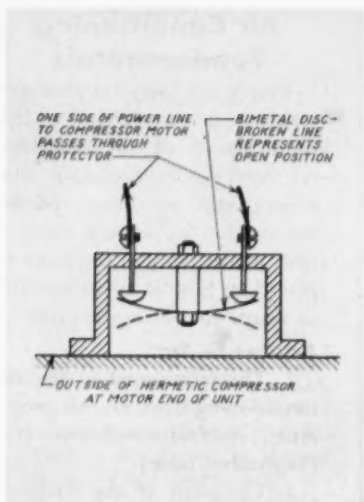
This is the 13th in a planned series of articles devoted to the fundamentals of air conditioning systems for summer and winter, and providing specific information on all the component parts. Special emphasis is placed on how to adapt cooling to warm air heating systems.

Articles So Far:

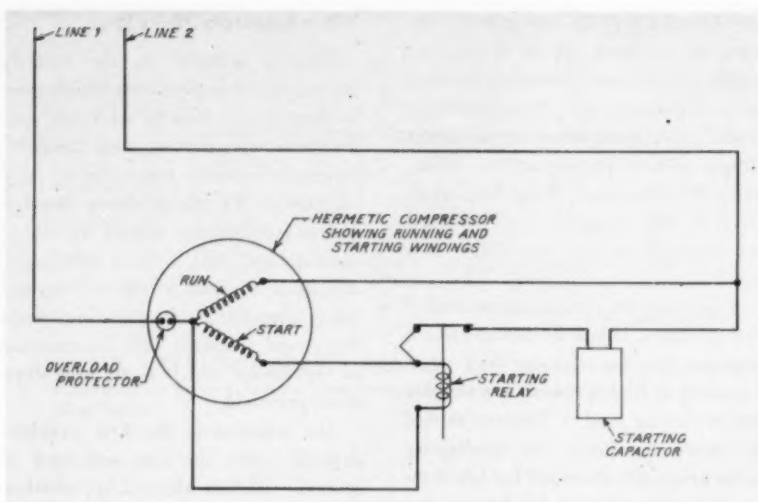
1. The terms used in the air conditioning field, i.e., air properties, comfort conditions, etc. (September issue)
2. The parts of the refrigeration system and how they work (October issue)
3. How to estimate cooling loads (November issue)
4. How to achieve proper air stream patterns in the conditioned space (December issue)
5. Duct design — comparison between sizing for summer and winter (January issue)
6. Condensing units (February issue)
7. Fans, fan motors and fan speeds (March issue)
8. Filters — throwaway, cleanable, electronic (April issue)
9. Condensers and water regulating valves (May issue)
10. Cooling towers and evaporative condensers (June issue)
11. Equipment selection (July issue)
12. Electrical control systems (August issue)
13. Electric controls (this issue)

Future Articles:

1. Sample problem — estimating cooling load and selecting equipment
2. Second sample problem, using different building and conditions
3. Trouble shooting — detecting malfunctioning of summer air conditioning equipment (two articles)
4. Replacement procedures for defective parts in cooling equipment (two articles)



3 INHERENT MOTOR protectors are used on small motors which do not require magnetic starters with their overload relays



4 THE SMALL, SINGLE PHASE, hermetic compressor motor is started with a wiring arrangement like the one shown

load relays. *Function:* Serves as means for automatically interrupting power supply to motors in response to controls. Built-in overload relays protect motors from sustained abnormal overloads too light to blow fuses.

3. Inherent motor protector. *Function:* Used on small motors which do not need magnetic starters. Performs same function as thermal overload relays in starters.

4. Starting relays and capacitors. *Function:* Used to start single phase hermetic motors.

5. Thermostat. *Function:* Temperature-sensitive device used in maintaining a temperature level within limits.

6. Humidistat. *Function:* Moisture or humidity-sensitive device used in maintaining a humidity level within limits.

7. High and Low Pressure Cutouts. *Function:* Pressure-sensitive switches used to stop the compressor motor whenever abnormally high or low pressures occur in the refrigerant system.

1 The Disconnect Switch

The size of the disconnect switch is determined by the ratings of the motors and current consuming devices connected to it. Fuses must be chosen no larger than necessary to give adequate protection to the power lines, yet they must be large enough to avoid burnouts caused by high starting currents.

Fig. 1 shows an improvement over the common fuse. It is a device known as the "Fusetron," which incorporates a thermal overload cutout. An abnormal increase in current through the coil heats a spindle and

melts a drop of solder. This allows the spring to pull loose the end of a fusible strip to open the circuit. Additional protection for short circuits or extreme overloads is afforded by the fusible strip which will burn through as will a regular fuse. This device gives better protection than a fuse because it can be selected to trip at a lighter load than a fuse and yet it will "stay in" during the starting interval due to the time lag in melting the solder.

2 The Magnetic Starter

Fig. 2 is a diagrammatic representation of a magnetic motor starter with thermal overload relays. Once the disconnect switch has been closed, the starter takes over the job of making and breaking the power lines to the equipment. The starter shown is hooked up for 3 phase current. Power lines from the disconnect switch enter the "line" side of the starter at terminals L_1 , L_2 and L_3 . Power lines to the motor leave the starter on the "load" side at terminals T_1 , T_2 , and T_3 . An extra contact is often provided for interlocking auxiliaries such as a cooling tower.

Note that in addition to the main power circuit to the motor, there is a secondary circuit shown by the lighter lines. Starting at L_1 , current

can pass first through a thermal overload relay, then through the starter operating coil, next through a second overload relay, then through the switches and controls used in starting and stopping the unit and finally back to terminal L_3 to complete the circuit. When the coil is energized, it will, by magnetic attraction, move the contactor until the main power contacts are closed. When the coil circuit is broken by the opening of any one of the temperature, pressure, or overload controls, the contactor will fall back and open the power circuit to the compressor motor.

The thermal overload relays in the coil circuit are operated by an excessive amount of heat generated by an abnormally large current in the main power lines. The selection of heaters determines the amount of current required to cause the relay to open. Different size and different make motors require different heaters, depending upon their rated amperes. Normal heater selection is based upon a tripping current somewhere between 25 and 40 per cent above the rated motor current.

A common tripping mechanism makes use of a spring-loaded ratchet held from turning by a drop of solder. When the solder is melted by

heat from the heater, the ratchet slips and the relay opens, breaking the coil circuit and opening the main power contacts. Once the overload relay has opened, it must be reset. Automatic reset is available, but starters used with refrigerating equipment should always be of the manual reset type since all overload trip-outs should be investigated and the cause located and corrected.

3 The Inherent Protector

Fig. 3 shows a typical motor protector of the inherent type. This built-in device is used to protect small motors which do not require magnetic starters with their overload relays. The inherent protector is usually mounted on or in the motor where it is subject to heat from the motor winding. The actuating element is a bimetallic disc which has a snap action. The tripping point of this device depends upon a combination of the effects of heat from the motor winding and heat generated in it by the current passing through it.

The device must protect the motor against two hazards. The first occurs when the motor is started. If for some reason the motor does not get up to speed, the heavy starting current alone must trip the protector and stop the motor before any damage is done. The second hazard occurs over a longer period with a gradually increasing load on the motor which keeps raising the winding temperature. In this case, the effect of the heat from the motor winding lowers the current value required to trip the protector so that the tripping point occurs within a safe winding temperature.

The selection of an inherent protective device is a matter of considerable test and is usually done by the motor manufacturer or, in the case of a hermetic compressor, by its manufacturer.

4 Relays and Capacitors

Many types of motors are used in connection with air conditioning plants. All single phase motors require special starting arrangements which it is not our purpose to dis-

cuss here. Our main interest is in the small, single phase hermetic compressor motor. Because of its sealed up nature, it is not practical to build this motor with any built-in mechanical or electrical starting devices. This type motor is usually built with two windings, known as the starting and running windings. The purpose of the capacitors is to throw the starting winding current out of phase with the running winding current to produce the torque needed to start the motor turning. The purpose of the starting relay is to interrupt the current to the starting winding once the motor is up to speed.

Fig. 4 shows a typical wiring arrangement. When the circuit is closed, current passes through the running winding direct and through the starting winding in series with the relay and capacitor. Current in the start winding is out of phase with current in the run winding. The motor starts. When speed increases, voltage generated in the start winding is high enough to cause flow of current through the relay coil. This opens the relay and the motor continues to run on the running winding only.

5 Thermostats

Many interesting things could be written about the development and design of thermostats. From the dealer's viewpoint, however, there are certain fundamental facts that should be at hand with regard to the use of these instruments with cooling units.

First of all, it is obvious that heating thermostats cannot be used directly for cooling duty. The normal heating thermostat will have contacts that close on a fall in temperature, whereas the normal cooling thermostat requires contacts that close on a rise in temperature. Some thermostats are built for both duties, and how they operate is a matter of wiring. Heating thermostats can sometimes be used for cooling in conjunction with relays from which the proper contact action can be obtained.

Air conditioning systems may be

provided with one of two types of thermostats, the return air type, or the wall-mounted type. The latter are popular because they are accessible to the owner and are easily adjusted.

The return-air thermostat is usually found built into the smaller self-contained air conditioners. It has a vapor-filled or liquid-filled bulb connected by a small diameter tube to a bellows which operates the switch. Temperature changes in the return air affect the conditions in the bulb and cause an expansion or contraction of the bellows.

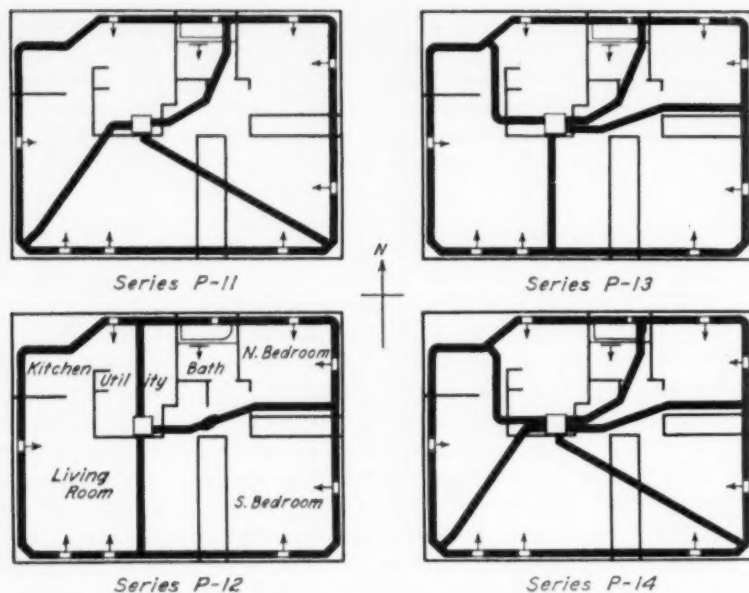
The operating element in the wall-mounted thermostat is usually bimetallic, although the vapor-filled and liquid-filled bellows are also used, especially on heavy duty units. The bimetallic strip is made of two different metals (usually invar, a nickel steel, and bronze) fused together. Since the bronze will expand nearly 20 times as much for a given temperature rise as will invar, the strip will deform to provide the movement needed to open and close the electrical contacts.

In addition to being classified by their mounting arrangement, thermostats are also classified by their electrical characteristics. Thus, we find the low voltage type and the line voltage type. Low voltage thermostats usually operate on 25 volt current requiring transformers. In addition, depending upon the electrical requirements of the devices being operated, it may be necessary to use relays having low voltage coils and heavy duty, line voltage contacts.

Line voltage thermostats may be used to control devices directly, providing their electrical requirements are within the limits of the thermostat contacts. For loads which exceed these limits, relays must be used. Contacts may be of the open type or of the sealed mercury tube type. In general, low voltage thermostats are of lighter construction and hence are more sensitive than heavier duty, line voltage types.

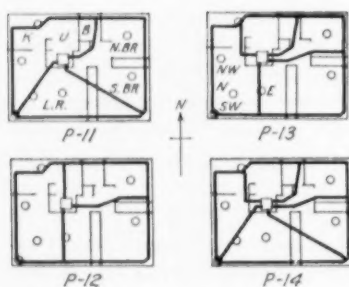
With regard to operating characteristics, thermostats are available in

(Please turn to page 106)



1 TESTS ON FOUR FEEDER ARRANGEMENTS show there is . . .

Comfort with Perimeter Loop Systems



Floor to Breathing Level
Temperature Differentials

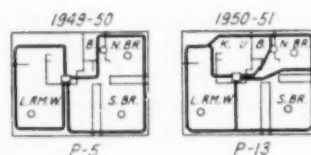
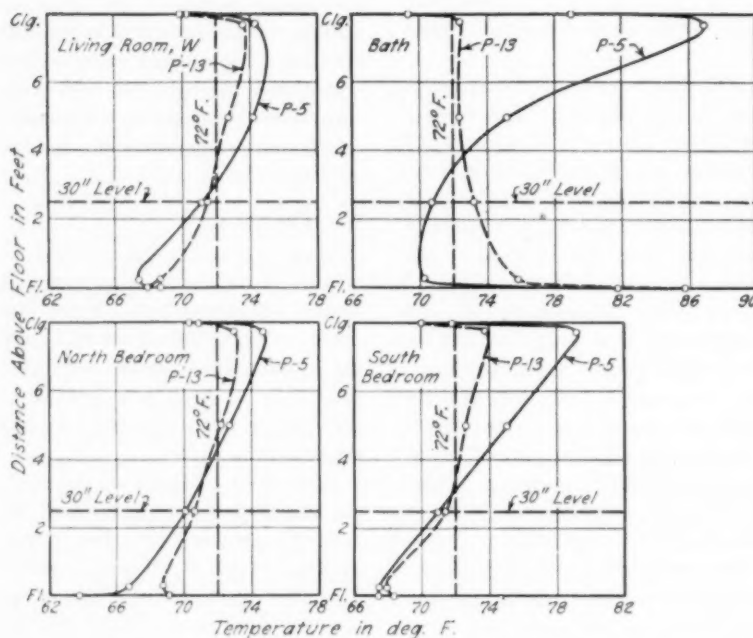
Series	P-11	P-12	P-13	P-14
L.R. (W)	1.0	4.0	4.2	1.6
L.R. (E)	2.8	0.9	1.1	2.6
L.R. (NW)	3.6	5.4	4.3	3.5
L.R. (SW)	1.5	4.7	4.5	0.9
N. Brm. (C)	4.6	2.4	3.8	4.0
Kitchen	6.8	5.1	2.6	4.0
S. Brm. (NE)	3.3	2.4	4.2	2.6
Average	3.4	3.5	3.5	2.7

Weather: No Sun;

Wind 2-7 m.p.h. (NW);

Outdoor Temp. 18-21 F.

2 ON THE BASIS OF such factors as vertical room-air temperature differentials . . .



Room-Air Temperature Differentials

	3"-Floor to 30"-Floor		3"-Floor to 60"-Floor		3"-Floor to 3"-Ceiling	
	P-5	P-13	P-5	P-13	P-5	P-13
L.R.(W)	3.8	2.8	6.8	4.1	7.0	5.0
Bath	0.6	2.6	5.0	3.4	16.6	3.4
N. BR.	3.4	1.9	6.0	3.5	8.1	4.2
S. BR.	3.5	3.5	7.6	4.7	11.8	5.9

Weather: No Sun; Wind 4-8 m.p.h. (NW); Outdoor Temp. 9-11 F.

3 WHICH ARE ALSO used to compare perimeter and two-loop systems

In the tests described, the perimeter loop system responded satisfactorily to sudden changes in outdoor temperature and maintained low vertical room-air temperature differentials, good temperature balance between key rooms, and warm floors (when feeder ducts extended to exposed floor corners). There was no difficulty in balancing the system by adjusting the shutter dampers in the floor registers

By S. Konzo

University of Illinois

IN THE PREVIOUS article of this series, a comparison was made of three conventional warm air systems with a two-loop perimeter system in Research Residence No. 3 at the University of Illinois. Because some heat had been introduced into the slab floor by means of the embedded ducts, the perimeter system was shown to possess distinct advantages over the three convection systems. In spite of the favorable performance of the two-loop perimeter system, a critical analysis indicated that further improvements were possible. This article will present the results from the second series of studies that were conducted during the winter of 1950-51 in the Research Residence, where four arrangements of feeders were used together with a continuous loop around the perimeter. These results will also be compared with those obtained with the two-loop system so that the improvements can be cited.

The analysis of the results obtained with the two-loop perimeter system indicated the possibilities of further improvement by the following changes:

- a) The perimeter loop should be retained, but the feeder ducts could be more strategically located.
- b) Relatively short distances between feeders and registers would be desirable.
- c) Feeders should be located so that all sections of the perimeter duct would serve as effective air passages. In other words, there should not be dead spots in the perimeter loop.

Four Arrangements Studied

During the summer of 1950, therefore, the slab floor in Resi-

Parts of this article are condensed from a complete report in University of Illinois Engineering Experiment Station Bulletin 403, *Comparative Performances of Two Warm Air Perimeter Systems and Three Convection Systems*, by M. E. Childs, R. W. Roose, H. T. Gilkey, and S. Konzo. Figs. 1 through 4 are from this bulletin.

dence No. 3 was removed to permit the installation of a new subfloor duct arrangement. The feeders were planned to provide four different arrangements for study. A total of seven feeders was installed and provisions were made for blocking each duct at both ends so that any combination of the seven could be used. The feeders were 4 in. below the floor at the subfloor plenum and sloped upward to the junction with the perimeter duct, which was 2 in. below the floor. Dimensions of the subfloor plenum were 20 in. x 20 in. x 18 in. deep.

Four main series of studies were conducted, the duct arrangements for which are shown in Fig. 1. The three-feeder arrangements of Series P-11 and P-12 were considered as minimum installations for a structure the size of Residence No. 3, whereas the five-feeder arrangement used in Series P-14 was considered as an optimum. Experimental conditions for the study are listed in Table 1.

In addition to the changes in the duct arrangement, the following changes were made in the conversion from the two-loop system:

- a) A counterflow furnace was used in place of the conventional furnace.
- b) The bathtub was raised 2 in. above the floor, and the warm air for the bathroom was introduced from the perimeter duct into the space below the tub. The air then entered the room through a narrow grille at the base of the tub.
- c) Smaller (4 in. x 14 in.) floor registers were substituted for the larger floor registers previously used. In addition, the number of registers was increased.

Room Temperatures Uniform

One index of performance is the normal variations in living zone temperature during the cyclical operation of the burner. Since the same furnace, thermostat, and fan switch settings were used for all four

How We Got Where We Are In WARM AIR

PERIMETER HEATING

the ninth in a series planned to tell about:

► **Investigations in the Research Residences at the University of Illinois**

► **Design and installation data (condensed from manuals published by the National Warm Air Heating and Air Conditioning Association)**

► **Specific phases of warm air heating**

... in articles so far:

► **heating basementless homes**

► **warm air ceiling panels**

► **heating slab floor homes with ceiling and floor panel systems**

► **floor panel-convection heating for slab floor homes — partially open and completely open**

► **survey of field practices**

► **new research residence built**

► **comparison of two loop perimeter and three convection systems**

► **comparison of perimeter loop and two loop system**

... in articles to come:

► **loop vs. radial system**

► **perimeter laboratory studies**

► **crawl space heating**

feeder arrangements, it would not be expected that appreciable differences in temperature control would occur. As contemplated, the variation of room-air temperature during a burner cycle was negligible with all four series, amounting to less than 0.5 F. This value was of the same order of magnitude as that obtained with the two-loop perimeter system.

Likewise, the response of the system to sudden changes in outdoor temperature was considered to be satisfactory. There was no evidence of lag or over-run of room-air temperatures during periods of rapidly changing outdoor temperature. The flywheel effect of the partially heated slab floor can be considered to be an important factor in providing negligible temperature variations in the living zone.

Balance Kept Between Rooms

Another index of performance is the temperature balance maintained between different key rooms in the house. For this purpose the differences in temperature between the living room and the bedrooms and in the corners of the living room were tabulated as shown in Table 2.

No difficulty was experienced in balancing the systems by adjusting

the shutter dampers in the floor registers. However, for the two arrangements in which corner feeder ducts were not used, the balancing process required more care.

The best balance was obtained with the five-feeder arrangement (Series P-14), the difference being consistently less than 1 F. With the other three arrangements the temperatures in the bedrooms were generally 1 to 2 F lower than those in the living room.

The maximum temperature difference observed between corners of the living room was only 1 to 2 F for all four arrangements. In the two arrangements where the feeder ducts did not extend into the corners of the living room, the maximum temperature difference was between 2 and 3 F. This shows the desirability of installing feeder ducts into the corner areas of major rooms.

Vertical Differentials Lower

From a comfort standpoint it is highly desirable to have a uniform temperature from floor to breathing level. The temperature differentials for an outdoor temperature of about 20 F are shown in Fig. 2 for the seven measuring stations in the Residence, represented as open circles in Fig. 2. The room-air temperature differentials experienced were satisfactory with all four duct arrangements, with the lowest average value obtained with the five-feeder arrangement. In general, however, the differentials obtained were superior to those obtained with the two-loop system.

The fact that the differentials were lower for the five-feeder arrangement may be attributed to the larger panel heating effect resulting from the use

of more feeders, and the effective location of the feeders.

A comparison of the temperature gradients for the two-loop system (Series P-5) and for one of the perimeter-loop systems (Series P-13) is shown in Fig. 3. The four-feeder arrangement used with Series P-13 was selected for the comparison because it was most nearly comparable in number and location of feeder ducts to the two-loop system.

The following generalizations were made:

a) Delivery of warm air into rooms from low-wall or baseboard registers resulted in differentials which were markedly superior to those obtained with high-wall delivery. (See Fig. 3. The bathroom differential from floor to ceiling levels was 16.6 F for Series P-5, when a high-wall register delivery was used in the bathroom, and was reduced to -3.4 F for Series P-13, which utilized a grille at the base of the bathtub).

b) Locating the feeder ducts so that all areas of the living space were provided with a relatively direct supply of warm air resulted in lower differentials. (See Fig. 3, north bedroom for both series. Also, see south bedroom.)

c) The use of two floor registers in a room in place of one resulted in better diffusion and lower register-air velocities, which in turn resulted in lower temperature differentials. (See Fig. 3. Compare cases shown for south bedroom.)

d) Locating the feeder ducts so that they extended into exposed corners of the floor provided an additional heat source in areas which tended to be cool and resulted in more satisfactory differentials in those areas. (See Fig. 2. Compare difference between Series P-11 and P-12 for living room east with difference between the same series for living room west.)

e) Locating the registers below windows resulted in lower differentials. This was because the warm air mixed with the downward current of cool air from the windows. (See Fig. 2, Series P-11. Compare kitchen and living room northwest.)

f) The use of a larger number of feeder ducts generally resulted in improved differentials since the panel heat-

Table 1—Experimental Conditions for All Four Series of Studies with Perimeter-Loop System

a. Temperature Rise, F.....	96
b. Air-Flow Rate, cfm.....	500
c. Location of Registers	
Liv. Rm. Fl. (W.); Fl. (S.); Fl. (S.)	
S. Bm. Fl. (S.); Fl. (E.)	
N. Bm. Fl. (N.); Fl. (E.)	
Bath. Base of Tub	
Kitchen. Fl. (NE.)	
d. One Return-Air Intake Used. .H.W. (North Wall Liv. Rm.)	
e. Fuel input, Btu per hr.....	65,000
f. Thermostat Setting, F.....	72
g. Fan Switch Settings, F.....	Cutin = 100 Cutout = 80
h. Limit Switch Settings, F.....	Cutout = 200 Cutin = 185
i. House occupied by two adults; no cooking	
j. No filters in unit	

Table 2—Temperature Differences Between Rooms and in Corners of Living Room

Series	Av. Diff. bet. Liv. Rm. and Bdrms., F	Max. Diff. bet. Corners of Liv. Rm., F
P-11	1-2	1-2
P-12	1-2	2-3
P-13	1-2	2-3
P-14	Less than 1	1-2

Note: all temperature differences shown were observed at the sitting level for an outdoor temperature of 30-40 F.

Table 3—Room-Air Temperature Differentials for Three-Feeder Perimeter-Loop System (Series P-11) as Affected by Outdoor Temperature

Temperature Differentials for an Outdoor Temperature of 30 F			
Room	3" Floor to 30" Floor	3" Floor to 60" Floor	3" Floor to 5" Ceiling
Liv. Rm. (SW.)	-0.7	0.4	1.6
Kitchen	3.7	4.8	6.8
N. Bm. (C.)	1.0	5.1	3.9
Temperature Differentials for an Outdoor Temperature of 0 F			
Room	3" Floor to 30" Floor	3" Floor to 60" Floor	3" Floor to 5" Ceiling
Liv. Rm. (SW.)	-0.6	1.0	3.8
Kitchen	5.4	8.2	11.3
N. Bm. (C.)	1.3	5.2	6.7

Note: Refer to Fig. 2 for Measuring Station Locations

ing effect was increased. (See Fig. 2. Compare Series P-11 and P-14.) However, the location of the feeder ducts was more important than the number used, provided that the number was sufficient to assure an adequate delivery of warm air to all sections of the perimeter duct. (See Fig. 2. Compare Series P-11 and P-13.)

The effect of outdoor temperature on the room-air temperature differentials for the three-feeder arrangement used with Series P-11 is shown in Table 3. Values are shown for outdoor temperatures of 30° F and 0° F for three typical locations. In the case of the living room (SW.) and the north bedroom, the temperature differentials increased only slightly with a decrease in outdoor temperature. However, in the kitchen the differential increased to a larger extent since a register was not located beneath the window to offset the effects of cool air from cold window surfaces and infiltration. In general, the change in differential with a change in outdoor temperature was small, in fact, smaller than that observed with a conventional warm air system in an insulated residence provided with storm sashes.

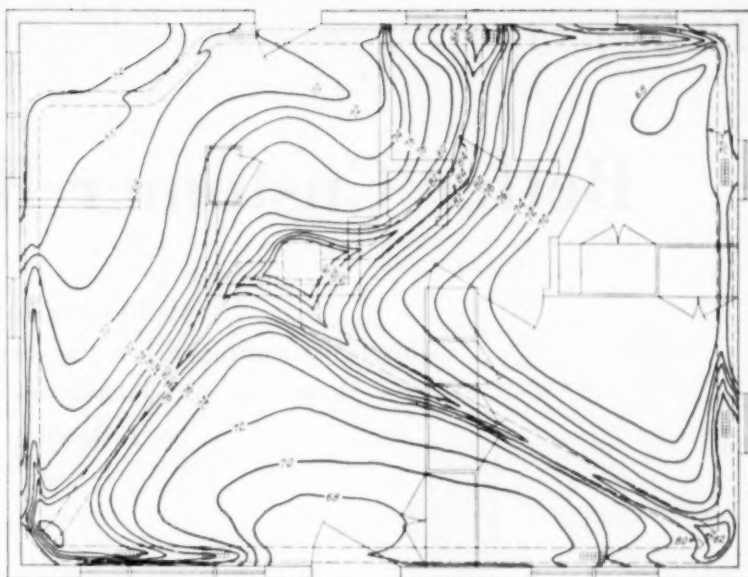
Floor-Surface Temperatures

One of the main purposes of the perimeter system was to maintain warm floor surfaces in a slab floor type of house. Thorough studies of floor surface temperatures with each of the four duct arrangements indicated that:

a) The floor-surface temperatures obtained with Series P-14 and P-11 were considerably better than those obtained with the two-loop system, but

b) With the two arrangements in which the feeder ducts did not extend into the corners (Series P-12 and P-13) the floor-surface temperatures were not markedly better than those for the two-loop system. With these arrangements, the floor surface temperatures were low in both the southwest corner of the living room and the southeast corner of the south bedroom, and it was not possible to increase these temperatures by additional balancing of the system.

Typical floor-surface isotherms (the constant temperature lines) are shown in Fig. 4 for the three-feeder arrangement (Series P-11). Although a more uniform pattern of floor-surface temperatures was obtained with the five-feeder arrangement (Series P-14) than with the



Weather: No Sun; Outdoor Temp. 30°-35° F; Wind 9-12 mph (SW)

4 THE FLOOR-SURFACE temperature pattern for the three-feeder arrangement (Series P-11) is shown because this system is typically applied to smaller homes. A more uniform pattern was achieved with the five-feeder arrangement

Series P-11, the pattern for the simpler three-feeder arrangement has been shown since it is more representative of the type of perimeter system applicable to small houses.

In connection with Fig. 4 the following observations were made:

a) The floor surface temperatures in the kitchen were low. This resulted from the fact that the distance along the feeder and perimeter ducts from the subfloor plenum was great. This low temperature area does indicate the need for extending feeder ducts into corner areas as well as for having sections of the perimeter duct at relatively short air-flow distances from the subfloor plenum. With Series P-14, a feeder duct was extended into the corner of the kitchen and the resulting floor-surface temperatures were considerably improved over those shown in Fig. 4.

b) The practically parallel isothermal lines over the feeder ducts were typical for a perimeter system in which the feeder ducts are installed with a uniform upward pitch from the subfloor plenum to the perimeter duct.

From an analysis of the floor-surface temperatures experienced with all of the perimeter systems over a wide range of outdoor temperatures, the following generalizations were made:

a) As the outdoor temperature decreased, the floor-surface temperatures in those areas away from the embedded ducts and in areas near the perimeter duct, but at a considerable distance from the subfloor

plenum, did not change appreciably from those shown in Fig. 4.

b) From the standpoint of comfort, as affected by floor-surface temperatures, the commonly accepted maximum values are 85° F for living spaces and 120° F for borders and aisles. Since the surface temperatures observed near the furnace and over the tee fittings were less than the value of 120° F for borders, neither of these areas were considered critical. It is true that a narrow strip of floor above the feeder ducts attained temperatures in excess of the 85° F accepted as a maximum for living areas. However, since such temperatures were obtained only in severe weather and since the critical area was narrow, exceeding these accepted limits was not considered serious.

In a detailed study of heat inputs to the Residence, a heat balance was made to determine the percentages of convection heating and panel heating experienced with the three-feeder arrangement (Series P-11). The panel heating effect from the heated floor slab on a mild day was about one-third as large as that for the energy entering the rooms through the registers. In other words, the perimeter-loop system functioned primarily as a convection system, but to some extent as a panel heating system. However, when considering all other heat inputs such as flue pipe loss, furnace casing loss, electrical energy, etc., only 77 per cent of the (Please turn to page 126)

10 Steps to

Better Customer Relations

The heating and sheet metal man who must compete for the consumer's dollar can keep his old customers and gain new ones by following a few simple rules

By Larston D. Farrar

ALTHOUGH PERSONAL INCOME is at the highest point in history in this country, there are now more firms in all lines of business competing for the consumer's dollar. The warm air heating dealer is therefore challenged not only to do a more efficient job, but also to develop better techniques for making friends among customers and potential customers.

The dealer should bring to bear on his business the human relations knowledge he acquires through experience, observation, or study. As an aid in this direction, here are 10 easy steps — a positive program — through which the dealer can maintain pleasant customer relations and gain new customers. To be effective, these steps should be made a part of his daily program.



1 Be sure that customers or prospects who come into the office or shop are greeted promptly and cordially.

This advice may sound elementary, but it is surprising how many times a home owner on his way to other appointments may drop by to ask advice, get an estimate, etc., and may stand for long minutes while the employees and management of a company ignore him. If there are good reasons — shortage of personnel, for example — why people who call cannot be met and their problems promptly attended to, they should be told why.



2 Be sure that there is someone to answer the telephone promptly and pleasantly during business hours.

The telephone, of course, has become one of the greatest business tools. Yet its misuse has created much ill-will, lost many customers, and caused a lot of time to be lost.

If a dealer is listed in the telephone book and there is a notice telling the

public when to call, he should be certain that there is someone to answer the telephone in case they do. He should also see to it that calls are taken courteously and in a business-like manner. The telephone should not be kept busy for long periods due to personal calls. Nothing is more discouraging to a customer, or would-be customer, than to call a business number again and again and either not have anyone answer or be greeted with the busy signal. Spur-of-the-moment potential customers invariably will try someone else. If the second line isn't busy, the first dealer has lost a customer through negligence of one of the simplest and most useful business techniques — telephone courtesy.

When the dealer or one of his employees talks on the telephone, the first thing he should do is identify the place of business, assuring the caller that he has the right number. This can be followed with, "At your service," or some similar, friendly expression.

It is a fundamental fact that most people make up their minds about a dealer on first contact. It is possible that many of them may change their minds later, but in general they will feel about him for a long time just the way they felt after the initial contact.



3 Be sure that you and the customer agree beyond doubt on the details of any future contacts or work to be done.

This rule covers such details as actual price, how the price is to be paid, etc. The contractor should take nothing for granted when making arrangements.

Suppose, for example, a customer and a dealer agree to meet at the customer's home at a certain time. The contractor doesn't show up. The customer gets another contractor to bid on the work, and gives it to him. Then the first contractor shows up — several days later — saying he had understood the customer to say this was the meeting day. This is a simple enough error, but such errors ruin good relations and lose business for the dealer.



4 Always try to keep the customer informed, at every stage of the job.

It is generally true of people that they "want to know." This is particularly true about any project in which they are interested, whether it be installations in one house, or a project. The dealer should see to it that the man who is paying the bills is kept informed at every step of the

job. This will tell him the dealer is interested in the progress of the work.

The customer should be consulted in emergencies or if changes are necessary. Many misunderstandings arise because the customer's information is not up to date.



5 Be sure the customer understands all details concerning payment.

The dealer who makes everything crystal clear before beginning work — about how much he expects to be paid, and when — simplifies this problem for himself. It is safe to say that many businessmen lose many customers in the course of a year, or fail to get new ones, merely because they do not follow this rule.



6 If there are misunderstandings, learn to cultivate an easygoing air.

Do not "push" people, or act frantic, no matter what the provocation. Every customer judges the dealer on everything he does — including his actions in "stress" conditions.

Suppose, for example, a customer is overdue on his payments. Hasty action by the dealer may result in unnecessary ill will.

The job of calling customers or sending out notices about their bills should be approached most carefully. The time for the dealer to check a

person's credit is before he agrees to do the work, not afterwards. If a customer with good credit does not pay on time, the dealer should not overemphasize this, but should realize that there are special circumstances in every case — illness, etc.

In such cases, the dealer should be patient. The old saying, "All things come to him who waits" is true in business.



7 Take an active interest in civic affairs.

Many businessmen take an interest in civic affairs for idealistic rather than business reasons. Yet, they find that this activity leads to new business. Through clubs of all sorts, fraternal organizations, church groups, etc., the dealer can help his community and himself.



8 When you meet people, identify yourself and your business.

In casual, intermittent contacts, the dealer should be sure to "self-advertise." Many businessmen never learn that all contacts give them a chance to advertise — at no particular cost to themselves. A dealer should make his name and his business affiliation known in golfing groups, at dinner clubs, etc.

(Please turn to page 106)

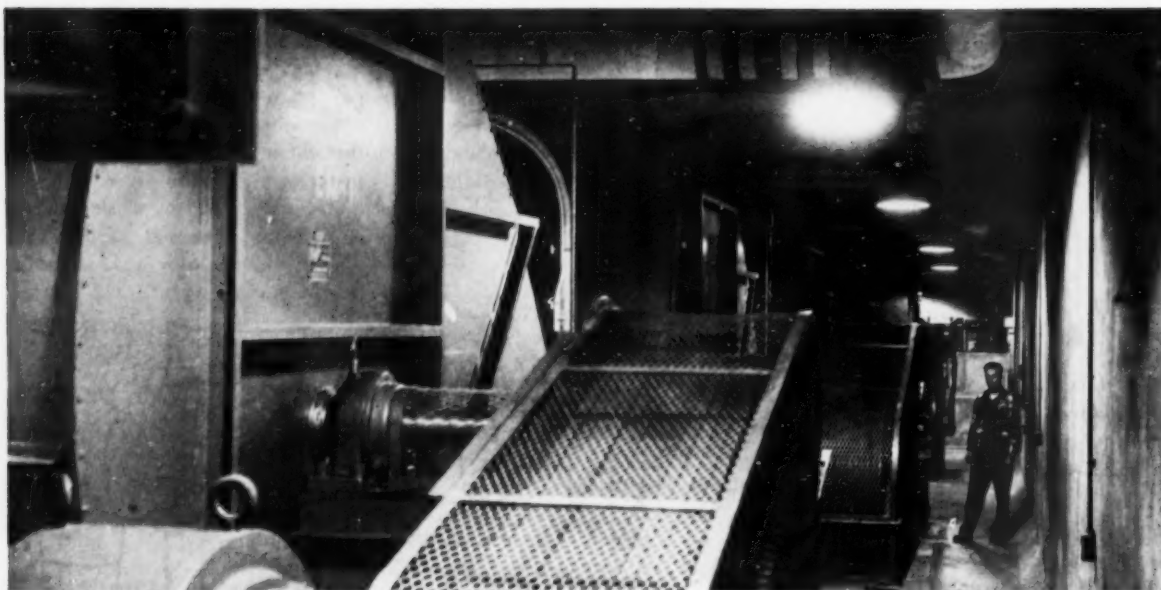


FIG. 1 — PART OF AN EXHAUST FAN BANK serving a process building. The construction of exhaust ductwork for radiological hazards requires careful attention to details and techniques

Constructing Ventilation Systems for Radioactive Work

By W. W. McIntosh

Mechanical Engineer
General Electric Co.

CONSTRUCTION OF ventilation systems for plants and laboratories in which radioactive work is done involves more severe requirements than are normally encountered. There must be no pulsation or variations in air flows and pressures during operation; high-quality construction which will be failure-proof and (insofar as possible) tamper-proof is required; and unusually difficult construction in regard to fabrication details, such as surface finish of the interior of some exhaust components, is needed.

CONSTRUCTING VENTILATION systems for buildings in which radioactive work is done is considerably more difficult than on the usual job. Unusually rigid requirements for quality of construction, the use of unconventional materials, the greater care required in layout, and adequate provision for controls are all problems which will be encountered and must be solved — in addition to those met in ordinary construction. Satisfactory execution of the work is dependent on having competent, experienced contractors, good field supervision and the full cooperation of the crafts involved

Air-tightness of certain ducts and certain structural features is essential; in addition, such work involves the use of unusual materials and types of fabrication.

Design Must Be Followed Carefully

The contractor must, in many instances, accomplish his normal work with rather sketchily prepared draw-

ings and specifications; consequently he has learned to rely on his own judgment and initiative to fill in the missing pieces in the design. This method of operation gets the job done, usually in a satisfactory manner, and is the only practicable method of operation for the contractor to adopt if he intends to stay in business on a profitable basis.

However, in complex structures in

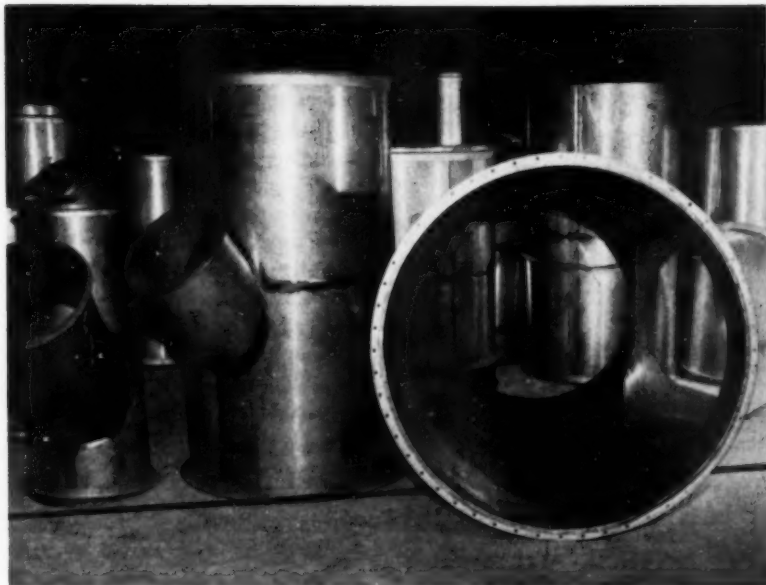


FIG. 2 — STAINLESS STEEL DUCT sections fabricated by welding with the inert gas shielded tungsten arc process. The large duct is about 5 ft in diameter

which radiological hazards exist, a great deal more than the normal number and types of building services must be furnished. Designs for such buildings must be much more carefully developed, and allocation of space between the services must be predetermined on the drafting board. Construction under these circumstances calls for some revision in the methods of operation on the part of the builder. Layout of all the services — electrical, piping and ventilation — must be carefully supervised so that the original design intent is not compromised. This caution applies with particular emphasis to ventilation equipment and ducts.

In addition to the normal requirements for adequate supply and exhaust with proper temperature control, ventilation systems for atomic plants must also meet requirements for exceptionally steady operation, absolute metering of air quantities to and from all spaces, carefully controlled velocities and quantities through certain ducts and openings, guaranteed pitch of certain ducts, and unobstructed access to certain ducts and appurtenances. Thus, the contractor has the responsibility for working closely with the engineer to insure that field changes do not jeopardize requirements of the system

which might not be recognized by the builder.

Good Ventilation Details Are Essential

Types of construction that represent good detail of ventilation system components are generally recognized in the trade. The need for adherence to good design of detail parts is more compelling in this work than in systems of more conventional types.

As mentioned above, every effort must be made to obtain steady, non-pulsing air flow in both the supply and exhaust systems. Most sources of flow disturbance can be eliminated by careful attention to details. Inlet ducts to fans should be carefully formed so as to distribute the flow of air uniformly across the entire cross section of the fan inlet connections. Elbows should be made with easy radii, or, better yet, with properly formed and rigidly constructed turning vanes. All transitions should be made with angles of divergent sides not greater than 15 deg. and preferably less. Dampers should be very rigidly constructed with no backlash between the blade and the shaft or between the shaft and the adjusting quadrant. Ducts should be heavily constructed and adequately reinforced, and should be further reinforced where required if panting

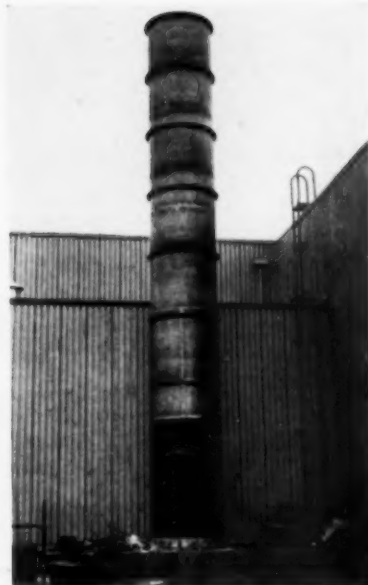


FIG. 3 — A WELDED ALUMINUM EXHAUST STACK for ventilation, downstream from the filters

or vibration is detected after the system is put in operation.

In systems where continuous operation is a requirement, it is customary to provide standby fans in parallel with the operating fans; normally, operation is rotated among the units.

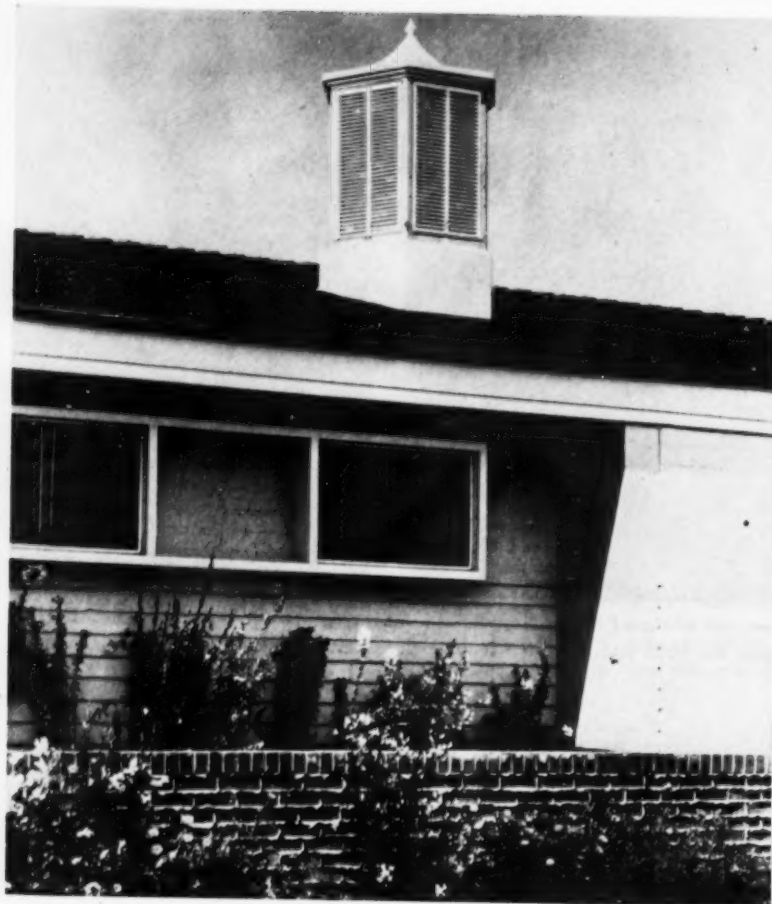
Multi-leaf louvered dampers are often used to isolate the non-operating unit from the remainder of the operating bank. Leakage of the dampers could result in considerable loss in bypassing of air back through the idle fan.

On the exhaust side, a definite radiation hazard might exist if it were not possible to close the dampers tightly on the idle unit during overhaul. It is quite obviously impossible to design and build a large louvered damper to be absolutely airtight, but it is also quite possible to fail to obtain nearly as efficient a closure as was designed into the damper if it is not properly assembled and adjusted. Care in this respect can frequently cut the leakage through a damper by as much as five times.

Good Shop Drawings Avoid Troubles

Most construction contracts involving projects of any magnitude

(Please turn to page 128)



1 IN DESIGNING the pad type cooler (shown here as a roof top installation), the special requirements of each part must be taken into account

Designing Pad Type Evaporative Coolers

... requires consideration of

By Robert S. Ash
Professional Engineer

- cabinet material
- filter media
- fan or blower
- motor
- water distribution system

THE 1953 MARKET for evaporative coolers has been estimated as approximately 450,000 units, about one half of which will be made and sold by independent sheet metal shops throughout the country. This month's article on evaporative coolers is directed to those who wish to develop their product by taking advantage of design techniques which have been accepted as standard by manufacturers of this type of equipment.

Many factors must be considered in designing and constructing the more common pad type cooler, shown in Fig 1 as a roof top installation, which consists essentially of a metal cabinet, fan, motor, pad, and water distribution system. The cabinet should be of such a size as to easily accommodate the fan and motor and give sufficient area to provide a reasonably low air velocity through the pad. Generally, the bottom pan of the cabinet should be at least 3 to 4 in. deep to form a sump or reservoir for the recirculation of water. Many coolers are required by state and local codes to be installed with a pump and float valve to conserve water.

The cabinet, in the case of a blower cooler, should be wide enough to permit an unlimited flow of air into the blower wheel housing inlet. All the open surfaces used to admit air to the supply plenum constitute the area of approach. This area should be approximately one and one-half times the area of the fan housing inlet (see Fig. 2). If this ratio is less, starving of the blower may result. Many well designed coolers, in order to achieve this necessary area of approach, are rectangular. This shape is often desirable from an appearance standpoint, especially if the cooler is installed in a window or against a wall, as it will "hug" the building more readily.

What Cabinet Material?

In addition to being sufficiently rigid, the cabinet must withstand both atmospheric and water corrosion if the cooler is to have a long and useful life. Coolers are made of sheet steel ranging from 24 to 16

gage for necessary strength and rigidity, the heavier gages being used in the larger size coolers. The many methods used to minimize corrosion include hot dipped galvanizing, electrolytic galvanizing, terne plating, porcelain enameling and resinous and asphaltic coatings.

The hot dipped galvanized steel cabinet is fabricated from sheets having approximately one ounce of galvanizing per sq ft. This gives excellent protection against corrosion. Some difficulty may be experienced in forming and drawing these sheets without flaking or peeling the galvanized coating. However, this can be overcome through proper design of the drawn members and through using what the steel mills designate as a "tight coat sheet."

Electrolytic galvanized steel lends itself readily to the forming and drawing operations encountered in the manufacturing of cooler cabinets; however, the amount of zinc deposited on the steel by the electrolytic process is less than one tenth of an ounce, the thickness of the "flash" zinc coating varying from 0.00001 to 0.00005 in. This type of sheet is usually received from the mill with a bonderized finish and is therefore excellent for painting, but under certain conditions it is susceptible to water corrosion and is therefore usually protected by the

application of some type of rust preventive coating.

Terne plate is a steel sheet which has been given a coating by immersion in a bath of terne metal. Long terne sheets with a commercial coating have approximately one quarter ounce coating of terne metal per sq ft and are known for good drawability and paint adhesion. Many resinous (plastic) and asphalt coatings have been made available in recent years and are being used in both black steel and electrolytic galvanized steel cooler cabinets for corrosion protection.

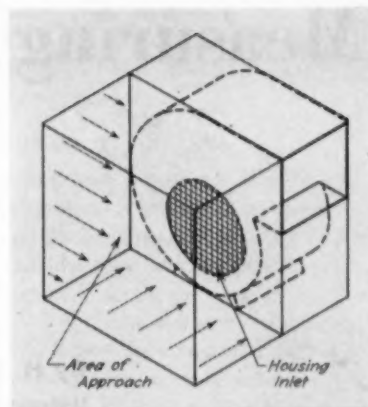
Which Filter Media?

The pad filter material used in evaporative coolers should possess a number of qualities. It should be:

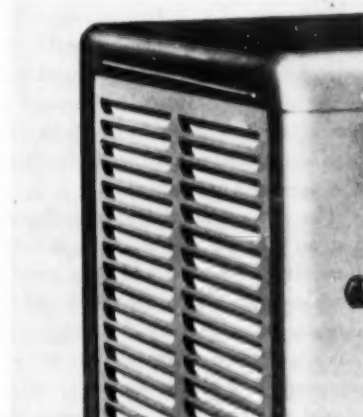
1. Able to absorb water
2. Finely divided
3. Free from objectionable odors when wet
4. Free from corrosive compounds
5. Free from grease and oil
6. Of minimum weight
7. Of maximum strength and flexibility
8. Resistant to decomposition in use
9. Low in initial cost
10. Easily maintained in place

Many evaporative cooler manufacturers use aspen excelsior for the pad. An interesting variation is the impregnation of the aspen excelsior with redwood to lessen the possibility of the formation of algae or fungus. Refined cellulose fiber strengthened with plastic is also used.

The bulk excelsior is either inserted in a metal frame or covered with cheese cloth and held in place in a pad grille by prongs or various patented means. If the latter method is used, stitching should be run through the pad to keep the excelsior from shifting, and the pads should be manufactured 1 in. oversize to eliminate possible voids when they are installed in the grille. The excelsior pads are made to give a weight of approximately 0.30 lb per sq ft for blower type coolers and approximately 0.20 lb per sq ft for fan type coolers. The latter are not intended to work against pressure and therefore the pads are not as thick. Pads are sized so that the air velocity through them does not



2 THE AREA OF APPROACH should be approximately one and one-half times the area of the fan housing inlet to avoid starving of the blower wheel



3 LOUVERS ARE PITCHED UPWARD to provide good pad saturation and to prevent the water from trickling out of the cooler

exceed 300 fpm, to give good saturation of the air, minimum air resistance or pressure drop (this should not exceed 0.10 in. water gage with clean pads), and to avoid water entrainment in the air stream.

In some small models, hardware cloth or expanded metal lath is frequently used on the exterior side of the cooler to hold the pad in place. (Since the exposed pad area is small, its appearance is not too important.) On larger models, however, a metal louvered exterior is usually used to make the cooler more attractive. The louvers are pitched upward instead of downward to give good pad

(Please turn to page 123)

WHY'S AND HOW'S OF EVAPORATIVE COOLING

This is the *third* in a series covering evaporative cooling.

ARTICLES SO FAR:

- ▶ How evaporative cooling works (July issue)
- ▶ Types of coolers (August issue)
- ▶ Cooler design and construction (this issue)

ARTICLES TO COME:

- ▶ Sizing the cooler
- ▶ Design of cooler installations
- ▶ The cooler industry and its sales

Measuring Actual Cooling Loads

... can involve computations dealing with condensing unit or evaporator coil operation. Actual cooling load may well be less than that calculated

By H. T. Gilkey, D. R. Bahnfleth, and R. W. Roose
University of Illinois

THE AIR CONDITIONING system discussed here was installed and studied in Research Residence No. 2 at the University of Illinois. It consisted of a year 'round air conditioner which contained a 2 ton condensing unit and was connected to a duct system which was designed only for heating the Residence in the winter. The registers were located in the high sidewall location on the interior walls of the Residence. The total air-flow rate through the unit was approximately 600 cfm, of which 120 cfm was introduced mechanically from outdoors. The blower was operated continuously.

The indoor dry bulb control temperature was 75 F, but no attempt was made to control the indoor relative humidity. The east and west windows of the Residence were equipped with canvas awnings and the south windows were shaded by the overhanging eave. The windows were not otherwise covered. The Residence was unoccupied and all windows and exterior doors were closed at all times; the first story rooms were separated from the basement by an interior door at the top of the basement stairs.

On a day during which the hourly outdoor-air temperatures closely approximated those of a design day, the maximum measured cooling load was 20,450 Btu per hr. This value is considerably lower than the calculated design cooling load of 25,000 Btu per hr which was obtained using the sol-air temperature method given in the ASHVE 1952 Guide.

Determine Actual Cooling Load by Heat Balance

The actual cooling load for the Residence was determined by making a heat balance of the various measured quantities at the condensing unit. The heat balance consisted of three components: the heat equivalent of the power input to the compressor, the heat removed from the conditioned air in the evaporator, and the total heat absorbed by the cooling water in the condensing unit. It was assumed that the heat absorbed by the cooling water while passing through the condensing unit

could be considered as the sum of the heat absorbed by the refrigerant in the evaporator and the heat equivalent of the power input to the compressor.

The data used to determine the actual cooling load imposed on the Residence was abstracted from the results of a special study for a typical day. The day selected was July 22, 1952, because the hourly outdoor-air temperatures and the daily range of outdoor-air temperature closely approximated those of a design day. Values abstracted from hourly observations were water-flow rate, power input to the compressor and water temperature rise through the condenser. The method used in making the heat balance can best be illustrated by an example and for this purpose the values observed at 3:00 p.m., the time of maximum calculated load, were employed. The heat balance was completed by applying the following equation:

$$H_c = H_e + H_{pt}$$

where

H_c = heat absorbed by the cooling water from the point of entry into the unit housing to the point at which it leaves the unit housing (Btu per hr)

H_e = heat absorbed from the air passing through the evaporator. This heat represents the net heat gain to the house, including gains from walls, glass, ceiling, and ventilation air, but excludes any loss through the basement walls (Btu per hr)

H_{pt} = heat equivalent of the power input to the compressor (Btu per hr)

The cooling load, H_c , is then equal to the difference $H_c = H_{pt}$.

For any experimental hour:

$$H_c = 8.33 Q (t_o - t_i)$$

where

Q = water-flow rate (gph)

8.33 = density of standard water (lb per gal)

$(t_o - t_i)$ = temperature difference between water outlet and inlet through condensing unit (F)

For the time under consideration:

$$H_c = 8.33 \times 136 (23.5) = 26,600 \text{ Btu per hr}$$

The heat equivalent of the power input to the unit can be found at any time as:

$$H_{pt} = 3413 \times \text{kwhr}$$

where 3413 is the heat equivalent of electrical energy, Btu per kwhr.

This value of H_{pt} for the hour under consideration is:

$$H_{pt} = 3413 \times 1.8 = 6150 \text{ Btu per hr}$$

H. T. Gilkey is Research Associate in Mechanical Engineering.
D. R. Bahnfleth is Research Associate in Mechanical Engineering.
R. W. Roose was formerly Research Assistant Professor of Mechanical Engineering.

The cooling load for this hour was then found to be (26,600 - 6150) Btu per hr or 20,450 Btu per hr. The cooling load was calculated by this method for each hour of every cycle throughout the day.

Compute Heat Removed by Evaporator Coil

The actual cooling load can be determined as the heat removed from the air in the evaporator coil. The heat removed by the evaporator coil was computed in two parts: the sensible heat removed from the air, and the latent heat absorbed in condensing the moisture from the air. The sensible heat removed from the air at any time can be calculated as:

$$H_s = Q \times d_s \times c_p \times \Delta t$$

where

H_s = sensible heat removed from the air (Btu per hr)

Q = air-flow rate (cfh)

d_s = density of standard air (0.075 lb per cu ft)

c_p = specific heat of air at constant pressure (0.24 Btu per lb, F)

Δt = temperature drop through the evaporator coil (F)

The latent heat removed at any time can be calculated as:

$$H_L = 1080 W_c$$

where

H_L = latent heat removed from the air (Btu per hr)

W_c = moisture condensing rate (lb water per hr)

1080 = the approximate amount of heat removed from the condensed moisture, including superheat, latent heat, and sub-cooling (Btu per hr)

The preceding calculations have been made for the typical hour selected with the following results:

$$H_s = 37,320 \times 0.075 \times 0.24 \times 22.4$$

$$= 15,080 \text{ Btu per hr,}$$

and

$$H_L = 1080 \times 4.9 = 5300 \text{ Btu per hr.}$$

The sum of these two values gives a total of 20,380 Btu per hr as the total heat absorbed in the evaporator. This is a deviation of -0.34 per cent from the net cooling load as calculated previously by using the heat balance around the condenser. During periods of continuous operation, the deviation of actual cooling loads as determined by the two methods varied by less than + 5 per cent, which indicates a good agreement between the two methods. For short cycles of operation, how-

ever, the heat balance at the condensing unit must be relied upon to determine the cooling load, since unsteady conditions at the evaporator make an energy balance too difficult to be of any practical use.

Time Lag Not Constant

Although the cooling load imposed by the heat flow through the walls and ceiling was small in comparison to that imposed through the windows, the time lag between the outer-surface and the inner-surface maximum temperatures was important in fixing the time of the maximum cooling load. If the time lag is to be defined in this manner, however, it must be recognized that factors other than the exterior-surface temperature and the room-air temperature can affect the temperature at the inner surface of the wall or ceiling. It can be seen in Table 1 that in several cases, the interior-surface temperature attained a maximum value before either the temperature on the room-side of the insulation or the heat flow reached a maximum. A possible explanation of this may be the combined effects of solar radiation and outdoor temperature entering the rooms through the relatively large window areas. This energy which entered the structure by radiation through the windows undoubtedly caused an increase in the temperature of the interior surface by re-radiation from the floor and other wall surfaces. Large window areas such as were used in the Residence are commonly found in residential construction, and thus the effects of diffuse and direct solar radiation are more severe in cooling this type of structure.

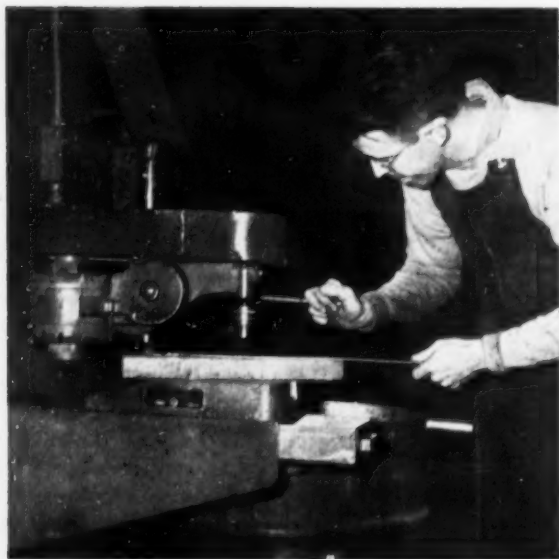
The time lags through the walls and ceiling did not remain constant from day to day. Table 1 shows that only the time lag on the west wall of the Residence remained constant from July 21 to July 22. Other tests revealed that the maximum temperatures measured within the west wall and the ceiling did not change more than 0.5 F from July 21 to July 22, and that the maximum heat flow changed less than 10 per cent. Similar measurements on the other walls of the Residence showed the same results. Furthermore, during the two days preceding this study, the maximum outdoor-air temperature was 90 F and above, and the sky was mostly clear. The variations in time lag therefore cannot be attributed to a temperature build-up within the walls and ceiling. That this is true would also be indicated by the inconsistent variations in the various walls. A combination of indoor and outdoor factors such as air-temperature, humidities, wind, and sun must have been causing this effect.

Despite the lack of exact information on the time lag of the heat flow imposed by the outdoor-air temperature and solar radiation, it is apparent that it was much less than the lag which would be estimated from information in the ASHVE Guide. The estimated lag for the type of construction in the Residence was five hours; the measured lag was less than three hours in all cases. Although it has been shown that the interior-surface temperature

(Please turn to page 102)

Table 1—Time Lags and Times of Occurrence of Maximum Temperatures and Heat Flow in the Walls and Ceiling of Research Residence No. 2

Date	Wall Orientation	Exterior Surface Temp	Room Side of Insulation Temp	Heat Meter	Interior Surface Temp	Exterior Surface to Interior Surface Time Lag, Hr Col. (4) - Col. (1)
		(1)	(2)	(3)	(4)	
7-21-52	East	9:00 a.m.	11:10 a.m.	11:15 a.m.	11:00 a.m.	2.0
	South	2:00 p.m.	4:15 p.m.	3:20 p.m.	3:50 p.m.	1.8
	West	4:10 p.m.	5:40 p.m.	6:10 p.m.	5:30 p.m.	1.3
	North	6:00 p.m.	6:10 p.m.	7:10 p.m.	6:15 p.m.	0.3
	Ceiling	3:00 p.m.	5:00 p.m.	5:00 p.m.	4:25 p.m.	1.4
7-22-52	East	9:20 a.m.	11:50 a.m.	11:00 a.m.	12:00 noon	2.7
	South	1:20 p.m.	3:30 p.m.	2:40 p.m.	2:30 p.m.	1.3
	West	4:10 p.m.	5:40 p.m.	5:50 p.m.	5:25 p.m.	1.3
	North	5:45 p.m.	6:45 p.m.	8:00 p.m.	6:30 p.m.	0.8
	Ceiling	2:40 p.m.	5:00 p.m.	4:30 p.m.	4:15 p.m.	1.6



1 A COUNTER-SINK permanently attached to the side of a press brake . . .



2 AND A FILING SYSTEM which rides on a track from stock room to office are among . . .

The Little Things That Save Shop Time

. . . and increase efficiency for a Rochester,
N. Y. firm, which also has devised some original
ways to increase business volume

By Lawrence E. Gichner
Sheet Metal Contractor

IN MANY SHOPS, when a mechanic wants to counter-sink a piece of metal, he has to take time to find a counter-sink drill, a press to put it in, and then the key to lock the two fast. Not so at the sheet metal firm of William J. Schmitt, Rochester, N.Y. This company has solved the problem by having a permanent counter-sink set up at all times, attached to the side of the press brake, as shown in Fig. 1. This is just one example of the many methods devised by the firm to increase efficiency.

Another interesting arrangement for speedy operation is a horizontal track on which a filing system rides back and forth from the stock room to the accounting department (Fig. 2). This keeps the office quickly posted on

what is ordered, what is on hand and what is arriving.

How to store ladders also becomes a problem in many organizations. Piled one on top of another, they have a tendency to break, and the one that is wanted always seems to be at the bottom of the pile. The William J. Schmitt firm has constructed a ladder rack of channel iron that makes for both easy storage and quick handling. On a series of protruding arms, the ladders are easily stored or removed, as shown in Fig. 3.

Nameplate Brings Repeat Business

The company has devised ways to increase business volume as well as efficiency. "Best of all advertising



3 TO FACILITATE handling of ladders, they are stored on a channel iron rack with protruding arms

devices," says William Schmitt, Jr., "is a job well done, and a small metal nameplate identifying our product with us."

The firm recently was called in on a job many miles

from Rochester. A mill wanted another cyclone collector similar to the one the Schmitt company had made for it years ago. "The owner pointed to our little 1 x 3 in. black and white nameplate," Mr. Schmitt recounts. "It was a simple matter to brush off a bit of dust and find stamped on the tag both the date and job number. A little later, back in the office, it was easy to get out the records, check over the cost sheets, compute the estimate on present day prices, and, in a short while, give the customer a quotation." These same nameplates also are fastened to shop equipment and roving tools to keep them from getting lost.

The firm has found it a good policy to repeat its trade mark (the name of the firm, in script, as it appears on the nameplates). This mark is carried on all advertising as well as on purchase orders, printed stationery, job sheets, etc.

The company finds the phone book to be one of its best sources of advertising. It also takes advantage of special events which make good advertising copy. For example, it ran a full page newspaper advertisement celebrating its 40th anniversary.

The Schmitt company works on sheet metal of from 26 gage to 1/4 in., making whatever is desired in aluminum, copper, stainless steel, black and cold rolled iron, galvanized, and magnesium. Other jobs handled include boiler breechings, large acid tanks and loading dock boards, and the general run of sheet metal work for the construction industry.

Curing Corrosion at Stainless Steel Welds

AN OLD TERM, *Weld Decay*, has been used to describe a condition in which corrosion seems to attack selectively the welded areas of some chromium-nickel stainless steels. The term is inaccurately used, however, for metal does not decay, and close examination of failures always reveals that the corrosion centers slightly to either side of the actual weld, in the metal itself. However, *weld decay* does point to a real difficulty, and one which can still plague the unwary.

The cause of this trouble, according to a bulletin published by the Republic Steel Corp., is carbide precipitation. This occurs because stainless, like all other steels, contains carbon. Stainless must also contain a high percentage of chromium, which imparts corrosion resistance. Under certain temperature conditions the chromium in ordinary chromium-nickel types of stainless steel combines with some of the carbon, to form chromium carbide. When this happens, the steel is robbed of chromium necessary for resistance to corrosion, and corrosion may occur.

This carbide precipitation may appear in association with welds because welding necessarily produces temperature conditions favorable to formation of the carbide, the bulletin states. Under the electrode or torch, the welded metal is at melting temperature, about 2750 F. Away from the weld the temperature of the metal grades off to room temperature. Somewhere between,

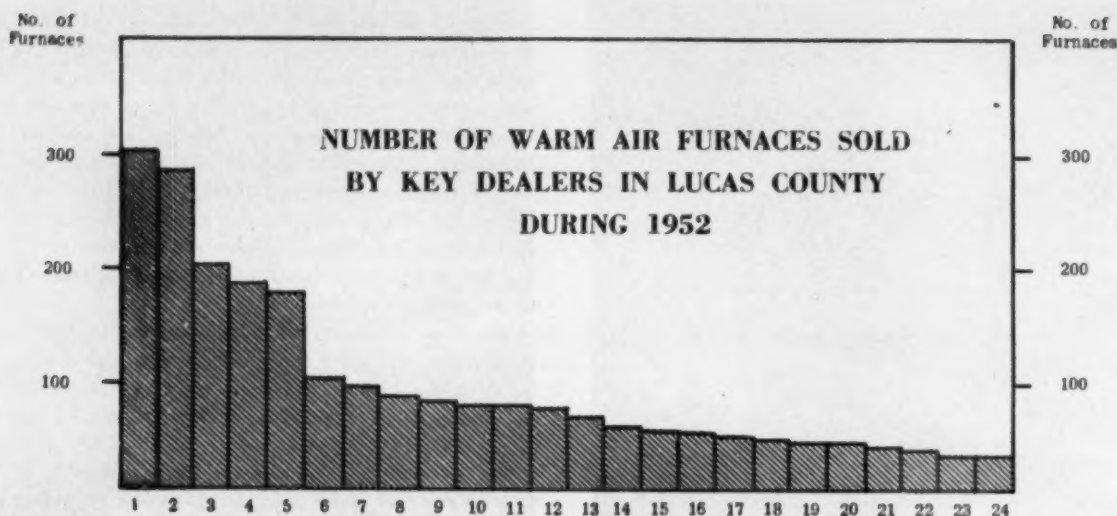
there must be a zone which is heated to 800-1500 F, the range in which precipitation occurs.

Ways to Reduce Corrosion

One way to counteract this effect is to anneal the entire weldment. Though the chromium carbides are stable at most temperatures, they will go back into solution if the metal is heated to 1900 F, and will remain in solution if subject to a rapid cooling or quench (from 1900 to 800 F in three minutes or less). This method is effective if the welded metal is to be used at temperatures outside the precipitation range.

Another remedy is to use steel with very little carbon. A chromium-nickel stainless steel with less than 0.08 per cent minimum carbon (Type 304) can be welded with no appreciable precipitation of carbides. However this type is not satisfactory if the metal is to remain for protracted periods within the precipitation temperature range.

A third solution is found in the stainless steel stabilized with titanium (Type 321) or columbium (Type 347), both of which have greater affinity for carbon than has chromium. Hence they form carbides with any free carbon present in the steel, leaving the chromium free to perform its function of preventing corrosion, according to the bulletin.



24 KEY DEALERS sold 2295 furnaces (80 per cent of the total sold in the area covered). The remaining 76 dealers (not shown) represented 76 per cent of all dealers and accounted for 20 per cent of the total furnace sales

A Factual Report on **Furnace Sales in the Toledo Area**

Are you getting your share of the warm air furnace business in your area? American Artisan's study of furnace sales in the Lucas County, Ohio, area may help you find out, since this area is typical of many throughout the country. Also, the method used here can be adapted to any area by the dealer interested in getting facts and figures which will help him make the most of his opportunities

WARM AIR HEATING DEALERS throughout the country are interested in marketing data for the areas in which they are operating. A study of the number and kind of furnaces sold in a given year can tell a dealer whether or not he is getting his share of the business, and whether or not he is one of the Key dealers.

The City of Toledo, located in Lucas County, Ohio, has a heating ordinance which requires licenses and permits for the installation of heating equipment. Similarly, the Lucas County heating ordinance, which is applicable to the county area outside of Toledo, also requires licenses and permits for the installation of heating equipment.

With the cooperation of the City of Toledo, the Lucas County divisions of inspection and warm air heating inspectors, American Artisan has tabulated permit and license record data on type of equipment, installer, and make of furnace for all furnaces installed in Lucas County during 1952.

Similar information was tabulated for gas and oil conversion burners installed in the City of Toledo during 1952. (Conversion burner permits are not required in the Lucas County area outside of Toledo).

Tabulations on dealers' activities and the makes of furnaces sold during 1952, together with comparisons for the year 1950, are presented here as a guide to further studies of the Toledo market. Even more important, they provide an example of how data can be used by a dealer to find out if he is making the most of the opportunities in his own marketing area.

The Furnace Market

The population of Lucas County, Ohio, is approximately 395,000, including the City of Toledo. According to the permit records there were 2853 furnaces sold by independent dealers during 1952.

Of the total furnace installations, 83 per cent were

forced air units and 17 per cent were gravity. Furnaces burned oil, gas and coal as fuel in the ratio of 68 per cent oil, 22 per cent gas and 10 per cent coal.

100 Dealers Did Work; 24 Did 80 Per Cent

There were over 100 dealers licensed to sell furnaces, but not all dealers made installations during 1952 because some were wet heat dealers who primarily do steam fitting and plumbing. Of the licensed independent dealers making installations, 100 sold from one to 302 furnaces, and 24 of these dealers made a total of 2295 furnace sales, or 80 per cent of all sales.

This is typical of what we find in all cities. Twenty to 25 per cent of the dealers do 75 to 80 per cent of the business. We call them Key dealers.

Key Dealers Sell More Than One Line

All except one of the Key dealers handled more than one make of furnace; in fact, each of the remaining Key dealers sold from two to 13 different makes. In the case of some of the furnace makes handled, Key dealers sold only a single furnace. Often, however, these multi-line Key dealers sold a good volume of each of three or more different furnace makes.

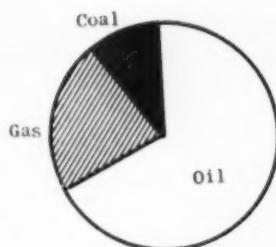
What About Plumbers?

In cities surveyed throughout the country, it has been found that few dealers sell both warm air and "wet heat" equipment. License records prove that this is the case in Toledo.

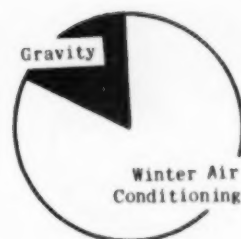
There are about 200 licensed plumbers and wet heat contractors in the Toledo area. Of these only 15 were licensed to do both warm air and wet heat work. There are two Key dealers who do both types of heating work. One of them sold 302 furnaces and 14 boilers; the second sold 200 furnaces and six boilers. The other 13 dealers who were licensed to do both types of heating work accounted for approximately 2 per cent of all furnace sales. Thus, there is practically no duplication of work between warm air and wet heat contractors.

Conversion Gas Burner Sales

Lucas County does not require dealers to obtain permits for conversion gas burners. However, the City of Toledo has an ordinance with this requirement. There were 255 conversion gas burners installed by independent dealers during 1952. Of this number, 87 per cent were sold by furnace dealers, 5 per cent by exclusive conver-



68 PER CENT of furnaces sold were oil fired, 22 per cent, gas fired, and 10 per cent coal fired



83 PER CENT of the furnaces sold were winter air conditioners; 17 per cent were gravity units

sion burner dealers and 8 per cent by plumbers and wet heat dealers who did not sell any furnaces.

Fourteen dealers sold 73 per cent of the gas conversion burners. Of this number, 12 were furnace dealers and 8 were Key dealers.

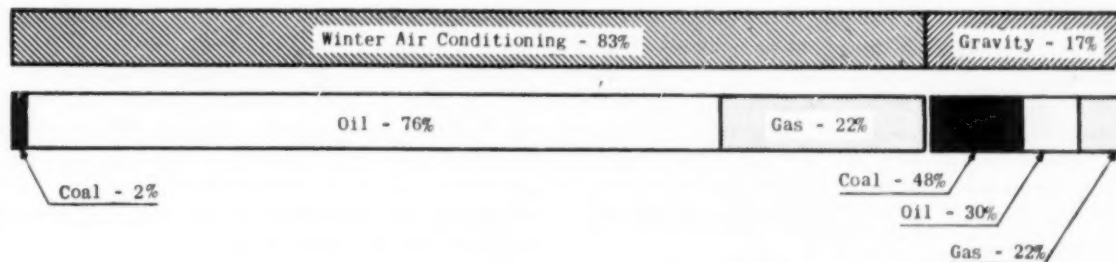
Conversion Oil Burner Sales

There were 161 conversion oil burners sold in Toledo during 1952 by independent dealers. Of this number, 150—or 93 per cent of the total—were sold by furnace dealers. Exclusive conversion burner dealers sold 6 per cent, and 1 per cent was sold by plumbing and wet heat contractors who did not sell any furnaces.

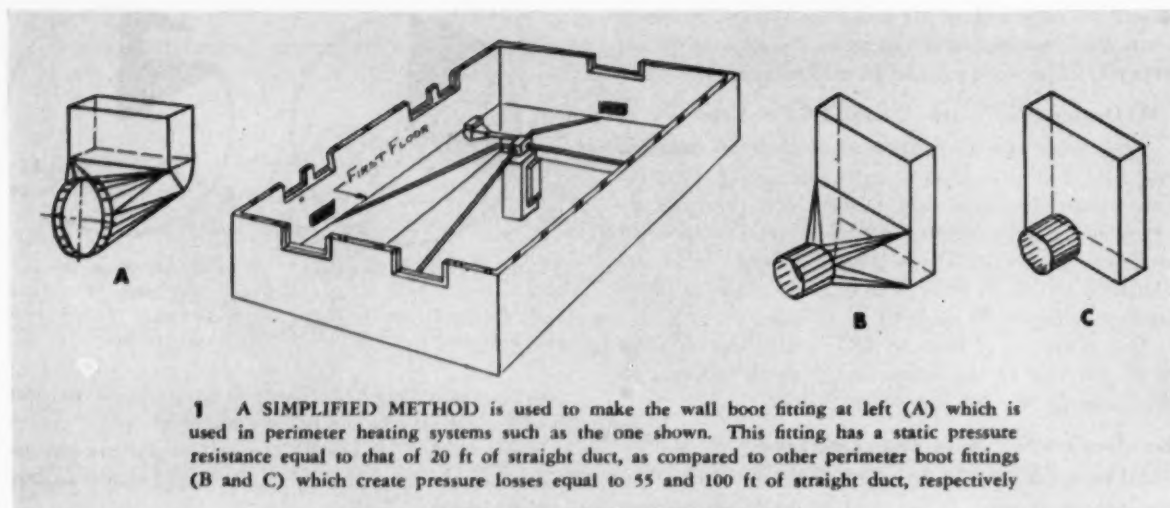
The 161 oil burners were sold by 25 dealers, six of whom sold 127, or 79 per cent of the total sales. Of these six dealers, five were furnace dealers and three were Key dealers who sold 74 per cent of the conversion burner business.

The National Market

The national furnace market is the sum of all the individual city and rural markets. What goes on in these individual cities is, unless unusual circumstances exist, representative of conditions in any other city. It is evident, from this study, that warm air heating is not a part of a lot of other businesses, but is a business in itself, carried on in large volume by established dealers who are cultivating every phase of the market—new construction, replacement and modernization. If other than warm air heating dealers are in the business, they are not identifiable in authoritative records and there is no recorded volume of any importance for which they are responsible.



THE PROPORTIONS of the different fuels used varied with the type of installation (winter air conditioners or gravity units)



How to Make a Perimeter Boot Fitting

... with low static pressure
loss, using a simplified method which reduces
the time required for laying out an accurate pattern

By Hugh B. Reid

Instructor, Sheet Metal Pattern Drawing

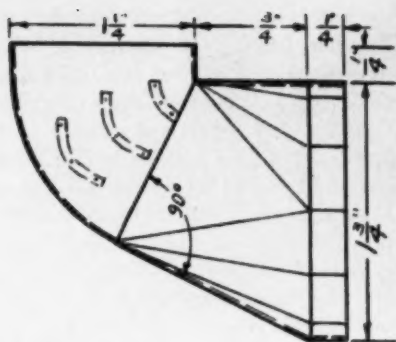
FIG. 1 SHOWS a layout for a perimeter heating installation with wall and floor registers. The pattern problem involves a practical design for a wall or floor boot. By way of comparison, two wall boots that are in common use in this type of installation are shown in Fig. 1 (B and C), with their equivalent loss in comparison of straight duct. Note that when the round duct enters the rectangular duct at 90 deg (Fig. 1, C), the equivalent static pressure loss is equal to 100 ft of straight duct. When a square to round fitting is added at the intersection of the rectangular duct (Fig. 1, B), the static pressure loss becomes equal to the loss in 55 ft of straight duct. The suggested design shown in Fig. 1, A, presents a wall boot that will reduce the loss to that of approximately 10 ft of straight duct if turning vanes are used, and 20 ft of straight duct if turning vanes are not used.

By use of the simplified method, Fig. 3, an accurate pattern layout for the fitting shown in Fig. 1, A, can be produced in about the same length of time as is

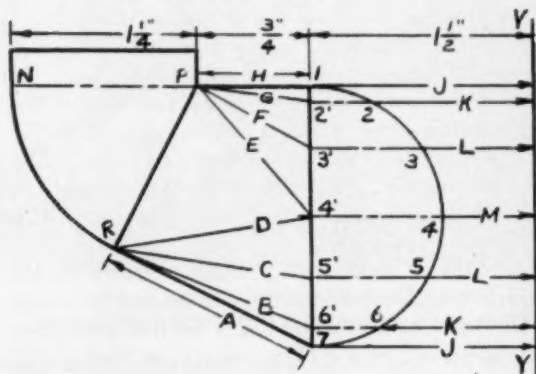
required to lay out the fittings shown in Fig. 1, B and C. With this method, all the true length lines can be developed from a combination of their vertical projections of the front view, Fig. 2, and the corresponding fall distances from the half circle (Fig. 3) to line Y-Y, as shown by lines J, K, L, and M. The pattern can be reserved for use as a standard fitting for repeat installations. The pattern layout, Fig. 4, shows a Pittsburgh lock seam on the back of the rectangular elbow; this can be substituted for a spot weld seam. The center seam is shown for rivets; it can be double seamed or spot welded. The number of turning vanes in any elbow is dependent on the size and throat radius of the elbow, and the air velocity. On a domestic heating installation, one vane positioned in the center of the elbow turn will add greatly to the efficient distribution of the air over the entire face of the floor register.

The turning vanes can be riveted or spot welded to the sides of the duct.

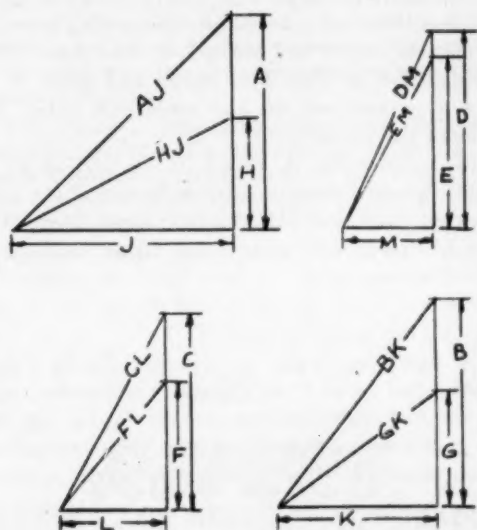
The following is a step by step analysis of the sim-



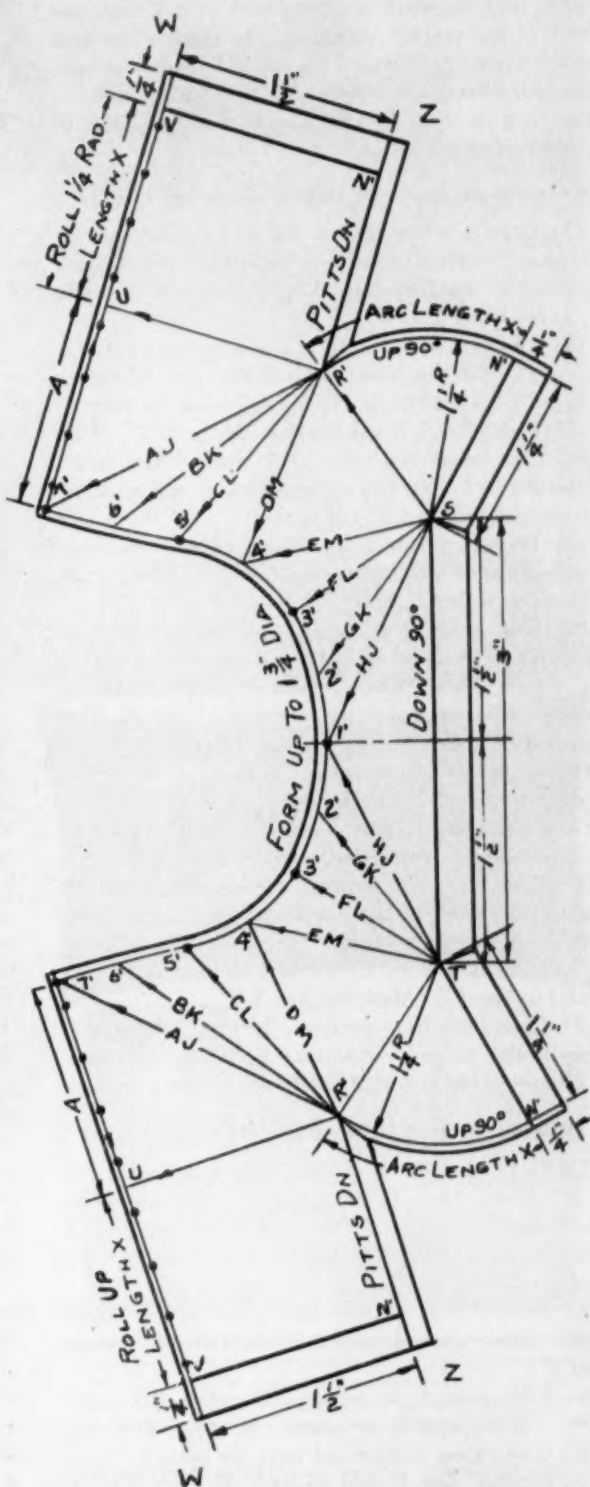
2 FRONT VIEW of the boot fitting with turning vanes installed



3 THIS SIMPLIFIED METHOD develops the true length lines needed for the pattern layout of Fig. 4



DEVELOPMENT OF TRUE LENGTH LINES for Fig. 4



4 FULL PATTERN and flange outline for the perimeter boot fitting

plified method for laying out the fitting shown in Fig. 1, A. In this sample problem, the fitting will have a supply duct diameter opening equal to 1.4 times the width of the register opening. The register openings for this layout problem are $1\frac{1}{4}$ in. wide and 3 in. long. Note that directional arrows are shown on the development lines on Fig. 4 as an aid to understanding the problem solution.

To Construct the Short Method Drawing, Fig. 3:

(1) Draw a horizontal line and on this line establish the point N. From point N measure $1\frac{1}{4}$ in. and mark the point P. From P measure $\frac{3}{4}$ in. and mark the point 1. Label line P-1 as H.

(2) Through point 1, draw a line perpendicular to line N-1. On this line measure the given diameter ($1\frac{1}{4}$ in. x 1.4), which is $1\frac{3}{4}$ in., and mark the point 7.

(3) Bisect line 1-7 and establish the point 4'. With point 4' as center and radius 4'-7, draw a half circle. Divide the half circle into six equal spaces and mark the division points 2, 3, 4, 5, and 6.

(4) Through points 2, 3, 4, 5, and 6, draw lines perpendicular to and intersecting line 1-7. Number the intersection points 2', 3', 4', 5', and 6'.

(5) With point P as center and radius P-N draw a long arc. From point 7 draw a line tangent to the arc. Draw a line through point P perpendicular to the tangent line and mark the intersection point R. Distance 7-R is labeled A.

(6) From point R, draw lines to points 4', 5', and 6' on diameter line 1-7. Mark these lines D, C, and B.

(7) From point P, draw lines to points 4', 3', and 2' on the diameter line and mark the lines E, F, and G.

(8) From line 1-7, measure the distance equal to one-half the width of the pattern rectangle (the width being 3 in. for this sample). From point 1, measure the half width $1\frac{1}{2}$ in. to the right and draw a line parallel to line 1-7. Mark this line Y-Y.

(9) Draw lines from points 1, 2, 3, 4, 5, 6, and 7, perpendicular to and intersecting line Y-Y, and mark the distances J, K, L, and M, as shown on Fig. 3.

To Develop the Full Pattern, Fig. 4:

(1) To develop the first true length line needed for the full pattern, Fig. 4, draw a right angle and from Fig. 3 transfer line H to the vertical leg and line J to the horizontal leg. The hypotenuse H-J is the true length line.

(2) Draw a 3 in. vertical line, given as the length of the register opening, and mark the extremity points S and T.

(3) With point S as center and radius H-J draw an arc. With point T as center and radius H-J, cut the arc drawn from point S and mark the point 1'.

(4) Transfer line G and distance K from Fig. 3 to the vertical and horizontal legs of a right angle. The hypotenuse G-K is the true length line. With points S on Fig. 4 as center and radius G-K, draw an arc. With point T as center and radius G-K, draw

an arc. Measure arc distance 1-2 on Fig. 3; with point 1' on Fig. 4 as center and radius 1-2, cut the arcs made with G-K as radius and mark the points 2'.

(5) Transfer line F and distance L from Fig. 3 to the horizontal and vertical legs of a right angle. The hypotenuse F-L is the true length line. With points S and T on Fig. 4 as centers and radius F-L, draw arcs. With spacing 2-3 on the half circle, Fig. 3, as radius, and points 2' on Fig. 4 as centers, cut the arcs made with F-L as radius and mark the points 3'.

(6) Line E and distance M are transferred from Fig. 3 to the vertical and horizontal legs of a right angle to produce the hypotenuse line E-M. With points S and T on Fig. 4 as centers and radius E-M, draw arcs. With arc length 3-4 on the half circle, Fig. 3, as radius and points 3' on Fig. 4 as centers, cut the arcs made with radius E-M and mark the points 4'.

(7) Measure line D on Fig. 3 and transfer this distance to the vertical leg of a right angle. Measure distance M and transfer this length to the horizontal leg of a right angle. The hypotenuse line marked D-M is the developed true length line. With points 4' on Fig. 4 as centers and radius D-M draw arcs. With distance P-R on Fig. 3 as radius and points S and T on Fig. 4 as centers, cut the arcs made with radius D-M and mark the points R'.

(8) Draw a right angle. Transfer length C and distance L to the vertical and horizontal legs of a right angle. The hypotenuse line C-L is the true length line. With points R' on Fig. 4 as centers and radius C-L, draw arcs. With arc length 4-5 on the half circle, Fig. 3, as radius and points 4' on Fig. 4 as centers, cut the arcs made with radius C-L and mark the points 5'.

(9) Transfer line B and distance K to the vertical and horizontal legs of a right angle. The hypotenuse line B-K is the true length line. With points R' on Fig. 4 as centers and radius B-K, draw arcs. With arc length 5-6 on Fig. 3 as radius and points 5' on Fig. 4 as centers, cut the arcs made with radius B-K and mark the points 6'.

(10) Transfer line A, Fig. 3, to the vertical leg of a right angle and distance J to the horizontal leg. The hypotenuse marked A-J is the true length line. With points R' on Fig. 4 as centers and A-J as radius, draw arcs. With arc length 6-7 on Fig. 3 as radius and points 6' on Fig. 4 as centers, cut the arcs made with radius A-J and mark the points 7'.

(11) With line length R-7 (marked A) on Fig. 3 as radius, and points 7' on Fig. 4 as centers, draw arcs. With the half width distance marked $1\frac{1}{2}$ in. on Fig. 3 as radius, and points R' on Fig. 4 as centers, cut the arcs made with A as radius and mark the points U.

(12) On Fig. 4, extend lines A. From points R', draw lines parallel to lines A. Measure arc R-N on Fig. 3 and working from lines R'-U on Fig. 4, transfer this length to the extended lines drawn from points R' and U and mark the points V and N'. Through the points draw the lines V-N'.

(Please turn to page 159)

**STATE CAPITOL
BUILDING
JEFFERSON CITY
MO.**



*Architect and contractor consulted with Revere's
Technical Advisory Service to assure best possible installation*

Before setting up specifications for the repair of this roof, Ralph McSweeney, Director of Public Buildings, consulted with Revere and the resulting information was referred to in specifications going to bidders. The successful contractor, Paul Mueller Company, Springfield, Mo., also called upon Revere to discuss details of construction. In turn, a member of Revere's Technical Advisory Service consulted with the Director and Contractor on construction details, each one contributing his knowledge and experience. The result was a job so satisfactory that the contractor has been awarded additional State work.

It is this kind of cooperation that Revere's Technical Advisory Service, backed by the extensive experience of its Research Department, stands ready to give you. Take advantage of it. Such cooperation invariably results in a more satisfactory job and a reputation for good work.

Protect your reputation. Give your jobs the many benefits of Revere Copper. See the Revere Distributor nearest you about Revere Sheet, Strip or Roll Copper for flashing and roofing. Particularly ask him about the money-saving advantages of Revere Keystone Thru-Wall Flashing.* And, if you have technical problems, he will put you in touch with Revere's Technical Advisory Service. **Patented*

REVERE
COPPER AND BRASS INCORPORATED

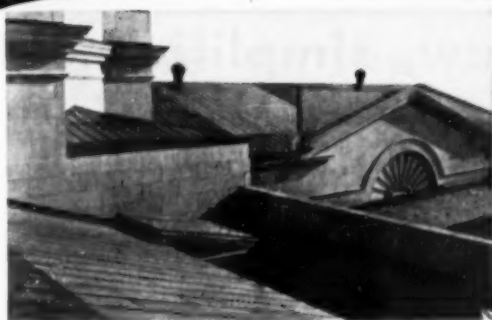
Founded by Paul Revere in 1801
230 Park Avenue, New York 17, N. Y.

*Mills: Baltimore, Md.; Chicago and Clinton, Ill.; Detroit, Mich.;
Los Angeles and Riverside, Calif.; New Bedford, Mass.; Rome, N. Y.—
Sales Offices in Principal Cities, Distributors Everywhere.*

SEE REVERE'S "MEET THE PRESS" ON NBC TELEVISION, SUNDAYS

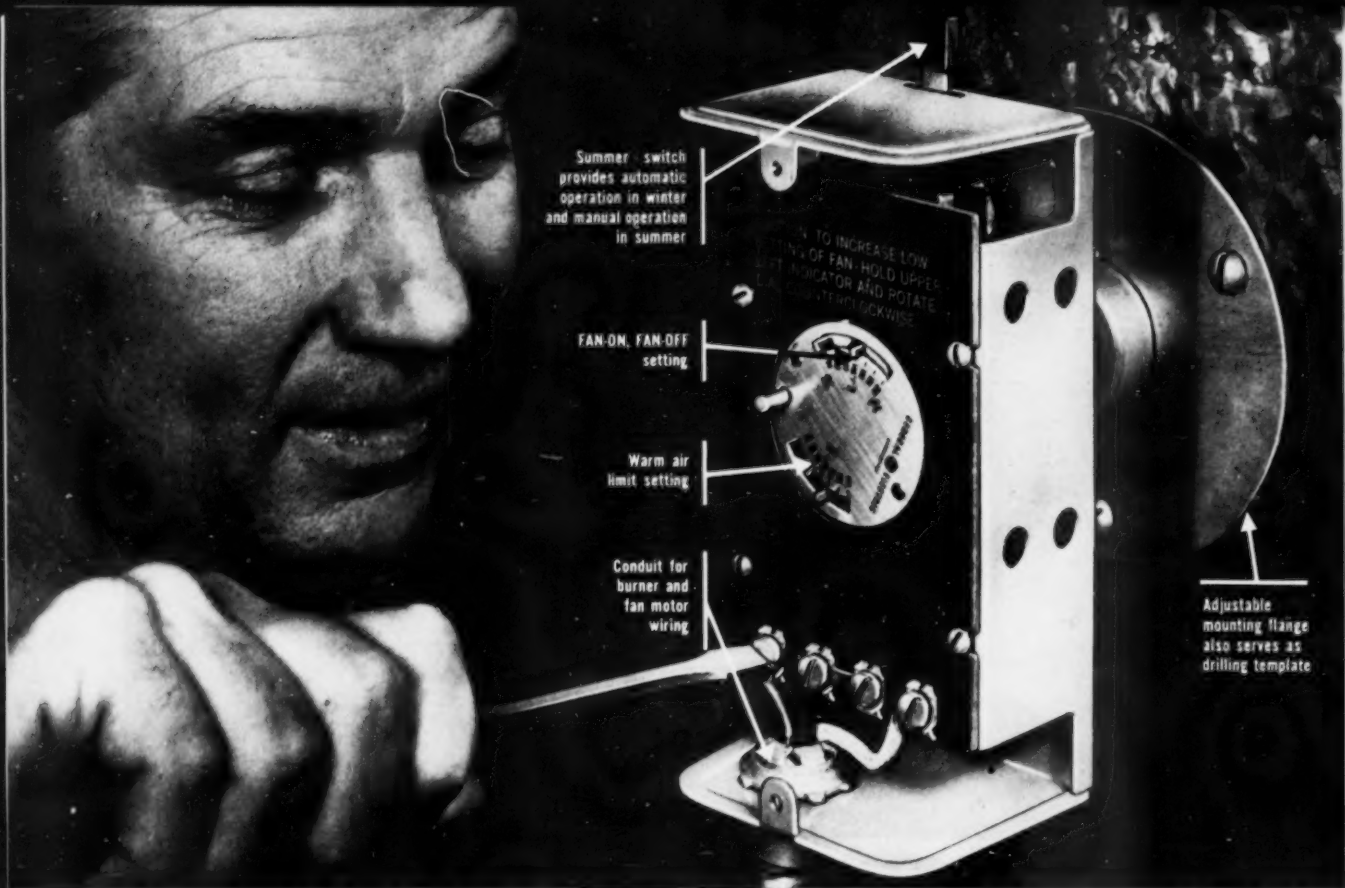
ANOTHER CASE OF

Copper
WHERE IT COUNTS



WORKMEN PREFER copper because it is readily formed and cut, takes solder beautifully. Architects and Contractors like it because it lasts and lasts, cannot rust or rot . . . protects their reputations. There is not another single metal or alloy that has all the outstanding construction characteristics of copper.

42,000 LBS. OF REVERE 16 oz. and 24 oz. Cold Rolled Copper was used on this standing seam roof on the wings of the State Capitol Building, Jefferson City, Mo. Copper was furnished by Revere Distributor, Hubbell Metals Inc., St. Louis, Kansas City, and Indianapolis. Installation was made in accordance with recommendations made in Revere's Booklet, "COPPER AND COMMON SENSE." If you do not have a copy send for one today.



G-E FAN AND LIMIT CONTROL installs quickly and easily. FAN-ON setting adjustable from 100F to 200F. FAN-OFF setting

adjustable from 80F to 180F, and warm air limit setting adjustable from 130F to 250F with removable stop at 200F.

EASY TO INSTALL!

New, simplified G-E Fan and Limit Control

Simplicity . . . that's the big feature of the new G-E fan and limit control for forced warm-air furnaces . . . and the big reason servicemen find it cuts on-the-job time and trouble.

SIMPLE TO INSTALL AND MOUNT

Control installs quickly in the furnace bonnet with an adjustable mounting flange that also serves as a drilling template. No levelling necessary! Ample space to work in and clearly marked terminals make wiring a fast, easy job.

SIMPLE CONSTRUCTION, POSITIVE OPERATION

Basically this control consists of two switches; the same fine switch used in other G-E limit controls, and a helix welded to a temperature dial. As the temperature varies, helix rotates and actuates the fan control and warm air

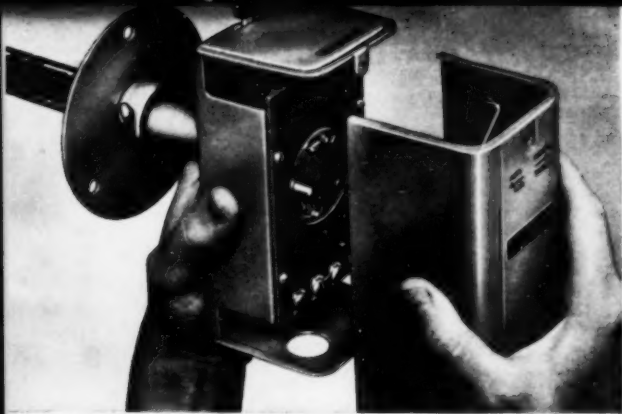
limit switches at the pre-selected settings, and protects against excessive bonnet temperatures. A big feature is that the control uses less parts than similar models to do the same job . . . and less parts mean fewer troubles, complaints and call-backs.

SIMPLE TO INSPECT AND SERVICE

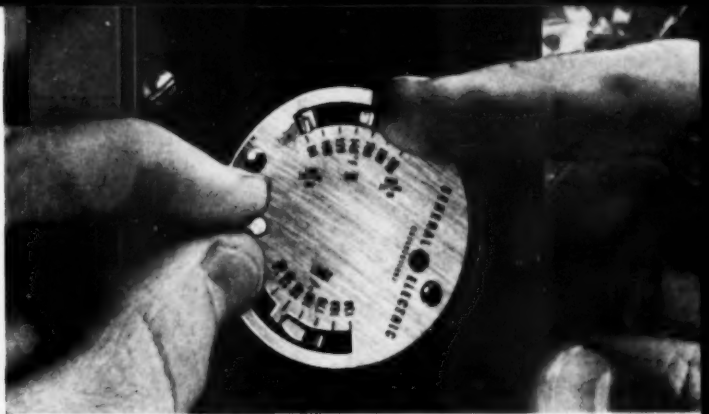
Screw-on panel pulls down easily exposing entire operating mechanism. If switch needs replacing, serviceman simply removes two screws and switch pulls right out. Dial-and-helix assembly can be removed without removing switches for fast easy inspection or replacement. For full details on this new control, see your local G-E Apparatus Sales Office or write for Bulletin GED-1832. Address Section 740-24, General Electric Co., Schenectady 5, N. Y.

You can put your confidence in—

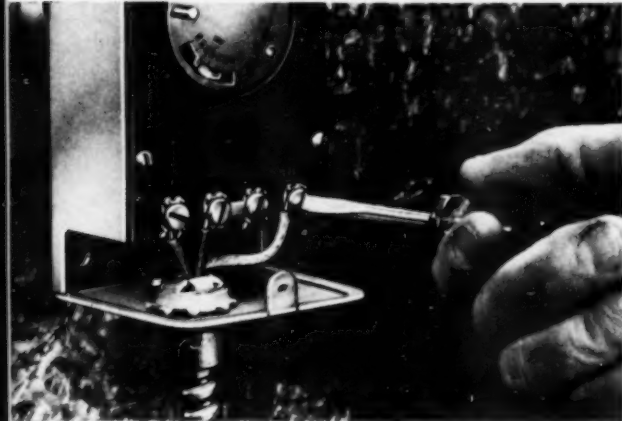
GENERAL  ELECTRIC



QUICK MOUNTING . . . simple, two-screw cover, adjustable flange, no levelling all add up to fast, easy mounting.



EASY TO SET . . . hold finger post steady so dial won't move and push pointers to desired settings.



SIMPLE TO WIRE . . . ample wiring space, clearly marked terminals and extra knock-out conduit entrance make wiring easy.



FULLY PROTECTED . . . completely enclosed switch mechanisms prevent entrance of foreign matter; metal guard prevents damage.

EASY TO SERVICE!

saves serviceman time, trouble on the job



OIL BURNER CONTROLS

The Appliance Control Department of General Electric is devoted exclusively to developing and producing a complete line of controls for appliance and oil-heating manufacturers.



THIS SHOP, which started as a 20 x 40 ft building in 1946, has now been enlarged to 40 x 128 ft. A separate 1800 sq ft building was recently erected to house . . .

"There's Money in Remodeling"

. . . says a heating and sheet metal man in Colton, Calif., who has increased his remodeling volume by a program of customer service, consistent advertising and creative selling

By Robert F. Welch

HARVEY O. WRIGHT of Colton, Calif., is cultivating a market which some observers have been pointing to as representing a tremendous potential for heating and sheet metal contractors. He is making a special effort to obtain remodeling and improvement business.

This country has been building over a million houses annually. Yet for every family moving into a new home, there may be as many as 50 families changing their living facilities to better quarters than they had before. One of their first thoughts is to make improvements, with modern heating and air conditioning equipment ranking high on the list.

Furthermore, the millions of people living in homes which are 10 or more years old are almost all likely



. . . THE MANUFACTURING OPERATION, which has reduced costs for the company. Here men at the power brake are turning out gravel stop

prospects for improved heating and cooling plants. It has been estimated that nearly \$10 billion a year will be spent on remodeling. The heating industry can get its share of that volume by going out after it.

Wright Sheet Metal Mfg. Co. of Colton has a certain geographical advantage in promoting work on older homes. While the climate of the area is admittedly mild, winter weather still gets sufficiently cold to cause discomfort when an undersized wall or floor furnace has to warm a two or three bedroom house.

Harvey Wright believes that his saturation point on installation of improved heating systems is still far off, despite the fact that he operates in a comparatively small town and has been "pushing" this type of work since

Better 3-Ways



- 1** BONDS VERTICALLY,
HORIZONTALLY,
AND LATERALLY.
- 2** PROVIDES NATURAL
WEEP DRAINAGE
- 3** EXPANDS AND
CONTRACTS WITH
TEMPERATURE CHANGES

KEY BONDING ACTION

Like a keyway in a machine shaft, this unique feature of Majestic Flashing bonds the metal mechanically with the mortar, eliminates separation and falling masonry.

7 CONVENIENT WAREHOUSES

Chicago	New York City
Cincinnati	Philadelphia
Cleveland	Pittsburgh
St. Louis	

HUSSEY

MAJESTIC 3-Way Thru Wall COPPER FLASHING

Majestic 3-Way Thru Wall Flashing was designed specifically to overcome the known problems of this type of flashing—bonding . . . crushing . . . and cracking due to sinkage, etc. The unique and exclusive Majestic design provides a three-way bonding action with the mortar—vertically, horizontally and laterally. The forming is also loadbearing which eliminates most possibilities of crushing during expansion, contraction or sinkage in the masonry, and provides natural channels for the drainage of weepage. Being of soft 16 gauge copper, Majestic Thru Wall Flashing is readily cut or formed on the job and resists all forms of corrosion for a lifetime. To be sure of flashing that installs most easily, is mechanically designed for its job and that offers the lifetime durability of copper . . . specify Hussey's Majestic 3-Way Thru Wall Copper Flashing.

COPPER & BRASS SINCE 1848



C. G. HUSSEY & CO.

(Division of Copper Range Co.)

Rolling Mills and General Offices
PITTSBURGH 19, PA.

he went into business in 1946. Although new construction accounts for an important part of his volume, his record of growth during the past seven years is chiefly the result of remodeling.

Mr. Wright started with a 20 x 40 ft building. Today that structure has been enlarged to 40 x 128 ft, and a separate 1800 sq ft building was recently erected to house the manufacturing operation.

There are three main principles which have increased his remodeling volume and made possible this record of consistent expansion: customer service, consistent advertising and creative selling.

Customer Service Boosts Remodeling Volume

Service to customers, Mr. Wright feels, means "leaning over backwards" to make sure a firm enjoys maximum good will. He can cite many examples of how such a policy works. For instance, one day just before closing time a stranger walked into the store and asked for a fitting which could not be located immediately. Mr. Wright spent 15 minutes searching for it so that the customer would not be forced to go elsewhere or come back the next day. When the fitting was found and the sale rung up, it amounted to just 25 cents! Several months later the same man came in and placed an order for a complete forced air furnace installation. He had remembered the considerate service given him previously, and decided Mr. Wright was the kind of a man he would like to do business with.

Another aspect of customer service is the company's policy of assisting with credit arrangements. Quite often purchasers will not have sufficient cash available, particularly when they're interested in a major house improvement. FHA's Title I loan is specifically designed for such people, but it's up to the contractor to tell his customers about it and guide them through the process of obtaining a loan.

Sometimes this proves to be a real stumbling block. Mr. Wright can cite many instances in which the buyer backed out of a sale when he was exposed to the red tape of making financial arrangements. For this type of customer, the company offers to "carry" a purchase on a 90 day open account. Thus, the customer is accommodated, and by first checking on credit standings, Mr. Wright avoids bad debt losses.

The general public responds well to the contractor who offers such complete service. People recommend the shop to their friends, and word gradually gets around to a great many home owners. It is still necessary, however, to contact as many prospective customers as possible by going out after them. Advertising is a major tool in this effort.

Advertising Also "Pays Off"

"There's no question but that advertising pays off in attracting remodeling business," Harvey Wright states. "I can actually regulate the volume of work passing through the shop by altering the size and number of newspaper insertions and amount of radio time. When

things are slack I step up the program, or reduce it a little when we've got a full schedule ahead of us. By operating in this fashion I don't have to add mechanics to the payroll to take care of work during a rush period and then lay them off when we're caught up."

Mr. Wright places his advertising according to seasonal demand. Last year he advertised for seven months out of the year, and will probably do about the same this year. During the cold season he pushes furnaces, and concentrates on evaporative coolers in the summer.

He adds to the impact of his advertising messages by tying them in with local marketing conditions. For instance, last year one of his newspaper insertions bore this headline. "Buy Now — A Few Coolers Left in Stock". At that time coolers were in short supply, and Mr. Wright wanted to capitalize on the fact that he had a stock on hand. This season there is no shortage of equipment, and a similar ad has this heading, "Air Condition Now And Save". The old headline would have been out of place.

Although Mr. Wright makes liberal use of manufacturers' layout suggestions and mat service, he tries to increase their effectiveness by giving them the local slant. Nor does he simply accept what the manufacturer offers because he has nothing better on hand. On one occasion, for example, a furnace company sent out mats showing how their sub-floor unit saves considerable space over competitive lines. Homes around Colton have no basements, and area under the floor is waste space. Nevertheless, several local firms used this layout and art work without considering its lack of appeal to local customers. Wright used a different selling point, feeling that nobody in the community would be attracted by the space-saving feature.

In addition to newspapers, he employs direct mail promotion, using a list of present and past customers. Even on small sales, the name and address of a customer is written down on the sales ticket. Having made one purchase from the firm, that customer is a good prospect for a larger order at a later date. Radio has also proved to be an effective medium, especially the sponsorship of news broadcasts. To round out his advertising activities, Mr. Wright leases four large billboards at strategic traffic locations in the community.

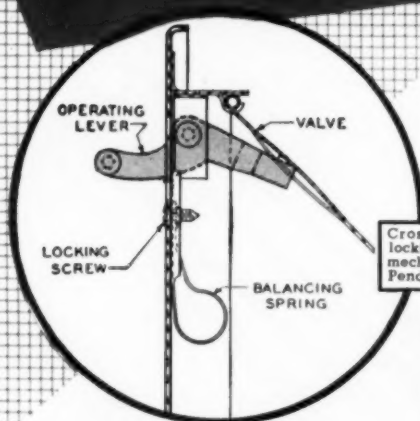
One Out of Three Prospects Sold!

The company has two salesmen to follow up on all leads brought in, and manages to sell an average of one out of three prospects. The salesmen are equipped with miniature estimating charts showing the average cost for each type of installation. These are typed out on 3 x 5 cards so they can be easily carried in a man's pocket. Using them, the salesman makes sure that he's quoting accurate prices and doesn't overlook some pertinent cost item such as sales tax.

The customer gets a bid on every job showing the total price, and the office copy has a complete itemized breakdown so the purchaser can be given full details if

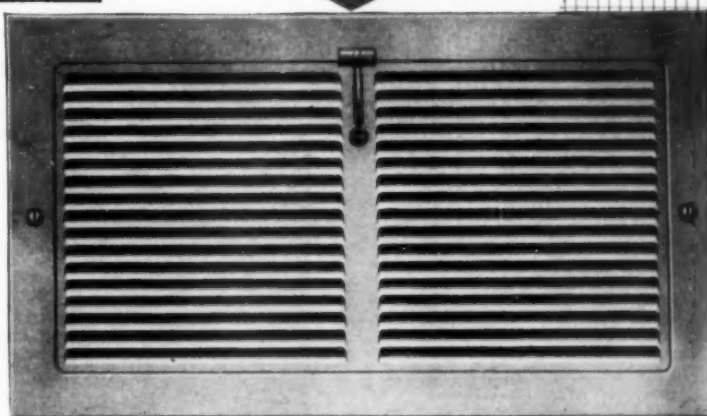
(Please turn to page 104)

Auer AIR CONDITIONING REGISTERS...



Cross-section of
locking-balancing
mechanism (Patent
Pending)

with easy, accurate
adjustable
limit-lock



Auer now offers a dependable locking volume control device for the single-valve forced-air and air conditioning registers. With this balancing device, the proper setting is easily and quickly made by one man. The adjustment is so simple and so securely set that it can be depended upon to maintain accurate predetermined CFM requirements.

Making the original adjustment or changing the setting can be done without marring the finish of the register face. A screw driver is the only tool needed. A slight turn of the locking screw on the front of the register releases the tension on a spring in the back. Valve can then be balanced at the desired point by the operating lever. Spring positively secures this position when locking screw is tightened. After adjustment is made,

the valve can still be entirely closed, but can be reopened only to the proper balancing point.

This precision adjustment device means that the Auer line of registers is now better than ever for modern air conditioning requirements—at no advance in price. Registers which are provided with this balancing mechanism as standard equipment include sizes 10 x 6, 12 x 6 and 14 x 6, in wall or baseboard models.

For complete information on Auer Air Conditioning
Registers write for Bulletin 7453.

Auer
REGISTERS
and GRILLES

THE AUER REGISTER CO. 6600 CLEMENT AVE. • CLEVELAND 5, OHIO

Canadian Distributor—Marchand Furnace Ltd., Tilbury, Ont.

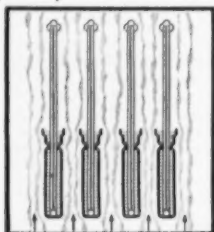
THE CONVECTOR HUMIDIFIER

doesn't choke even the smallest plenum

Compared to flat-bottom type humidifiers, Maid-O'-Mist Convector Humidifier means

- 60% less air restriction in plenum
- 30% more evaporation area
- 50% less installation time

Other advantages: 13 different sizes available, all parts non-corrosive copper or brass, pads of water absorbing materials, automatic float-operated supply valve. Get full details from your jobber or write for bulletin 701-B.



Exclusive!

Only Maid-O'-Mist's patented individual trough design offers such maximum evaporation areas with such minimum air restriction . . . essential in short cycle modern heating. Installation time cut 50% because you just cut out plenum opening and make water connections.

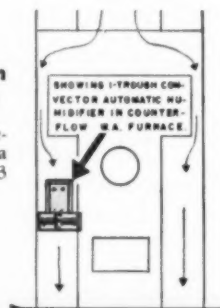


In conventional plenum — no air restriction

Actually 60% less air restriction because usual flat bottom pan is replaced by $\frac{3}{8}$ " vertical pans and pads.

In counterflow system — no air restriction

Depending on furnace design, can be installed in area with air passage only 3 inches wide



60%
less air restriction in plenum

30%
more evaporation area

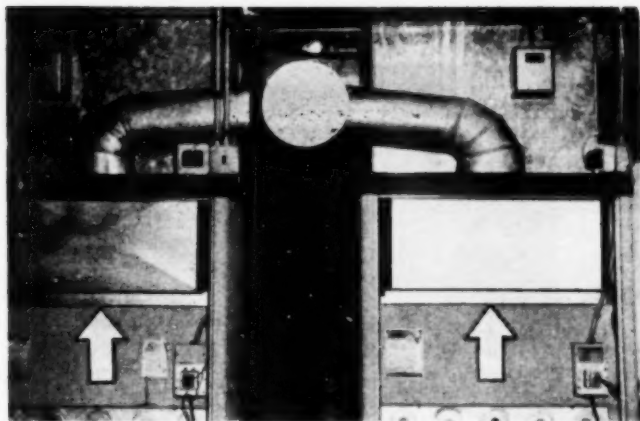
50%
less installation time



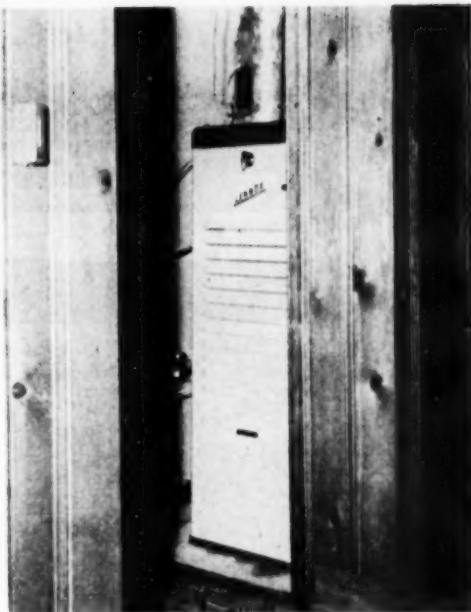
AUTOMATIC HUMIDIFIERS AUTO-VENTS
WATER LINE CONTROLS . HEATING SPECIALTIES

MAID-O'-MIST, Inc.

3217 NORTH PULASKI ROAD . CHICAGO 41, ILL.



1 THREE FURNACES providing a total of 265,000 Btu per hr capacity, were used in the installation described. The two furnaces in the basement (*left*) vent into a common breeching. Draft diverters are built in (*see arrows*). A closet-type furnace (*right*) supplies heat for the hallway and a study above the garage. Three-zone control is provided



Warm Air System for “Hard to Heat” Home

Three furnaces, zone control, intricate ductwork in tight quarters, a variety of outlets — all combine to provide complete winter comfort for a large home

By Herb Foss

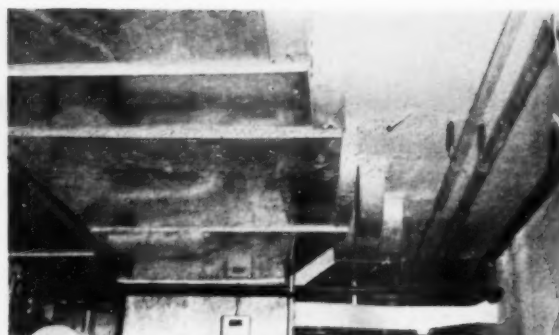
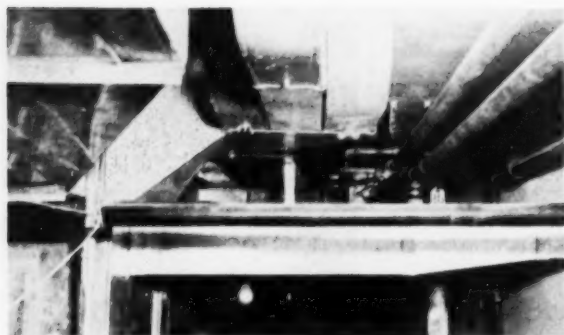
**Sales Engineer
The Lennox Furnace Co.**

WHEN IT comes to residential heating, Earl Bohat, of Conditioned Air Systems, Evanston, Ill., will perhaps always think of one particular system as the “big job”. That one is the warm air heating installation he made in the home of Dr. Mouzakeotis of Winnetka, Ill. This home requires two furnaces of 200,000 Btu per hr capacity in the basement, plus a 65,000 Btu per hr unit in a second floor closet (Fig. 1).

The job of distributing warm air effectively was a difficult one. First, the house is “rambling,” having 13

rooms, excluding the large basement and large reception halls. Second, the basement is almost completely utilized for living space. (It includes a complete kitchen, playroom, fireplace, bar, barbeque pit, and built-in planting boxes.) This meant ductwork could not be allowed to reduce the headroom too much (Fig. 2).

The problem was further complicated by the fact that there is only one chimney, so that the heating units could not be placed at both ends of the basement. To those complications add tight working conditions in the fur-



2 SHARP TURNS made in tight quarters characterize the ductwork. Note that whole banks of take-offs were needed (*right*) to supply sufficient heat to the various rooms



3 A VARIETY OF OUTLETS was used. In the kitchen (*left*), a supply register had to be located beneath a storage cabinet (*see arrow*). The ovens are vented to the exhaust duct above the cabinets. In the living room (*right*) floor registers counteract cold from the large glass area, and baseboard registers are used elsewhere

nace room, a large amount of plumbing and wiring in the basement ceiling, and a kitchen of built-ins that left almost no room for register outlets. In addition, an above-the-garage study had been added. Its floor, ceiling and three walls are exposed to outside temperatures.

How Problems Were Solved

Actually, the home required 62 openings for heating. The ductwork had to be fitted to meet the specific architectural designs of the various rooms. Of necessity, heating outlets included floor diffusers, wall registers and outlets in the toe-space under cabinets, as shown in Fig. 3.

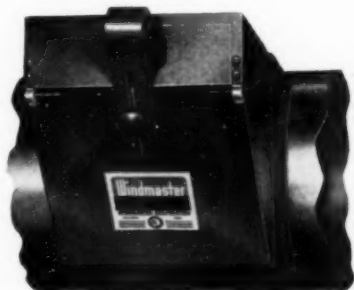
Two 200,000 Btu per hr gas furnaces were installed in the furnace room where warm air ducts cover most of the ceiling. Take-offs were numerous and frequent, calling for skilled sheet metal work in tight places. Most

of the ductwork in the basement was furred-in. In the kitchen, outlets were installed in toe spaces, overcoming the handicap of built-in cabinets and equipment that greatly limited the number of accessible locations. Heating of the exposed study above the garage was best accomplished by a separate gas furnace installed in a closet. A 65,000 Btu per hr highboy does the job.

The "big job" is controlled by three individual thermostats for three-zone control — providing the comforts of warm air conditioning in every corner of the house. The system first operated with Propane gas as the fuel, requiring two 1000 gallon storage tanks. Consumption with all three furnaces in operation was about 1000 gallons a month. When natural gas became available, the system was switched over by exchanging gas orifices.

Earl Bohat's "big job" testifies to the flexibility of warm air heating.

*Let'er Blow this fall
Windmaster's on the job*



If you aren't already using Windmaster Draft Controls to reduce unprofitable service calls this Fall and Winter, ask your wholesaler about these important Windmaster performance advantages. Or, write direct for latest literature and prices.

What a relief to know that Windmaster is *already* on the job working for you when October winds blow! It's the serviceman's friend for cutting down on those unprofitable service calls and "problem" installations. Here are a few of the reasons why:

MORE RELIEF OPENING GIVES EXTRA PROTECTION — The square vane of Windmaster gives more free area. This means better effectiveness in relieving excessive draft and greatly improved burner performance regardless of draft conditions.

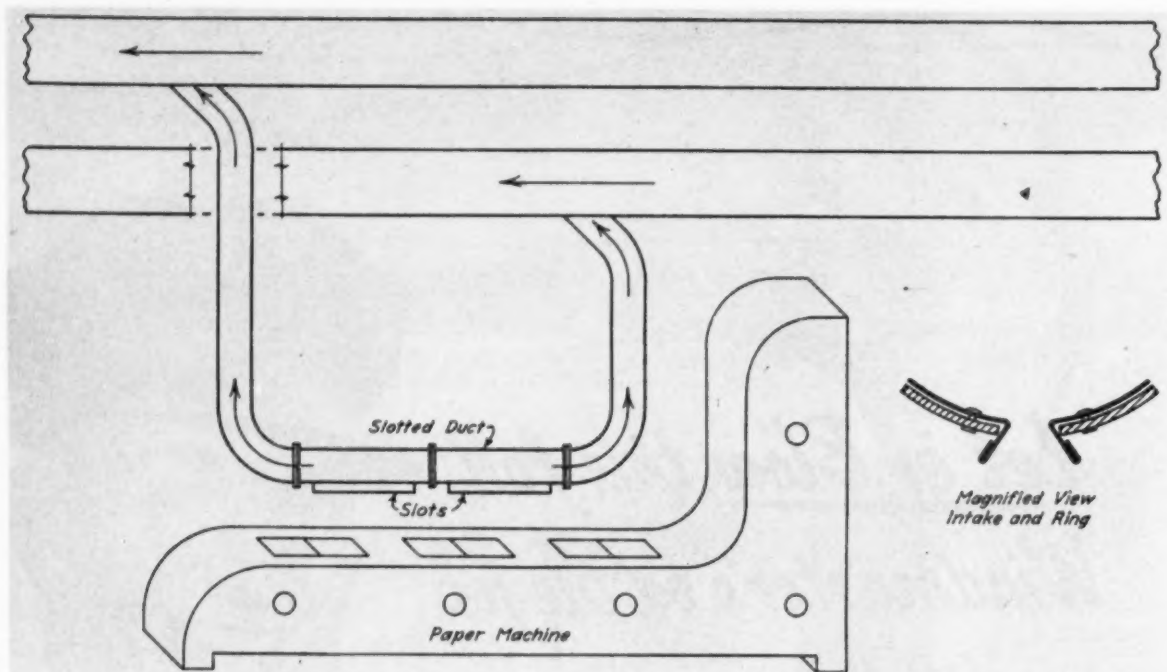
ANGULAR MOUNTED VANE FOR FASTER RESPONSES — Here's the answer to pesky pulsating jobs. With half the distance to travel, Windmaster's 45° angular mounted vane "arrives" quicker . . . gives more steady control of draft without lag-time or nervous quiver.

PERMANENTLY SILENT "JEWELLED MOVEMENT" — This is the cure for many common draft control complaints and headaches. Windmaster's vane rides on silent bearings of molded DuPont nylon that outwear steel, are free from friction, immune to corrosion and unaffected by temperature extremes.

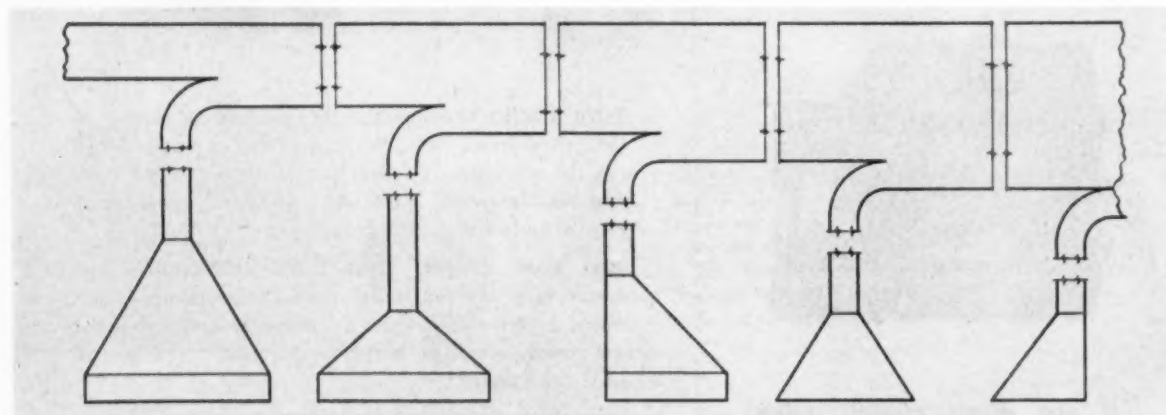
Windmaster Corporation
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1 WHERE COVERING HOODS cannot be installed over equipment, the slotted type of intake (shown in detail at right) has proven successful. This system utilizes two main ducts



2 IN THE CONVENTIONAL duct and hood dust removal system, the trunk duct is enlarged where each new branch duct joins the system so that the air velocity will remain the same

How to Design Dust Collecting Systems

By Ernest E. Zideck

... for removing lint and fiber dust in industrial applications. Described here are a special system for use where covering hoods cannot be used, and a conventional "step-up" system

THE REMOVAL OF LINT and fiber dust from machines used in the textile and paper industry often creates duct-cleaning problems for the factory maintenance crew. These problems can frequently be reduced to a minimum by the sheet metal contractor who engineers the dust collecting system.

Often a covering hood for machines of this type cannot be installed due to the nature of the mechanical operation of the equipment. In cases of this kind, the slotted type of intake (Fig. 1) has proven very successful.

The type of dust collecting system which utilizes this intake is composed of two main ducts, usually parallel to each other and about 20 ft apart, with branch ducts that drop down over the equipment and are connected to a round duct containing the slotted intake. This round duct must be of the correct capacity and should be placed in an out-of-the-way location, but near the source of the dust to be removed. Details of the intake opening are shown at right in Fig. 1. Stiffening and suspension rings are spaced about every 2 ft along the slotted intake duct.

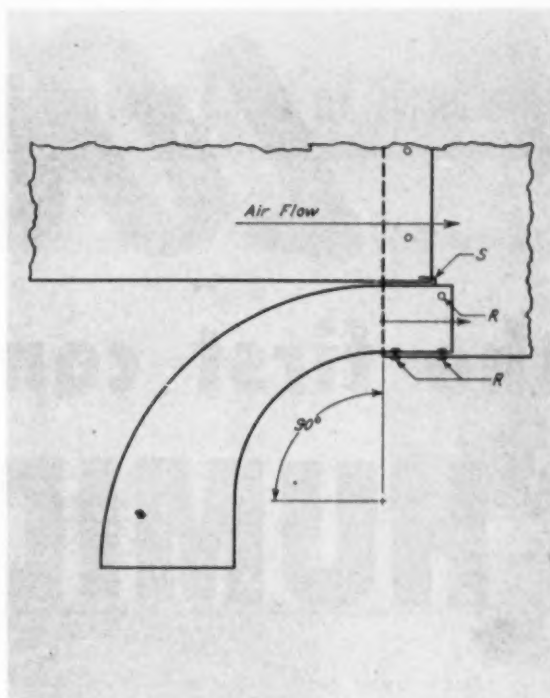
The efficiency of this type of dust removal system is in direct ratio to the amount of care taken in fabricating the individual parts; all burrs, rivets, seams, joints, etc., must be kept to the minimum number required. Every effort should be exerted to make all connections as tight as possible and as smooth as is practical because the dust from textile and paper box making machines is usually adhesive in nature and will fasten to any obstruction inside the duct. An accumulation of this dust at any one point will reduce the volume of air and increase the static resistance throughout the entire system.

Conventional System Uses "Step-Up" Principle

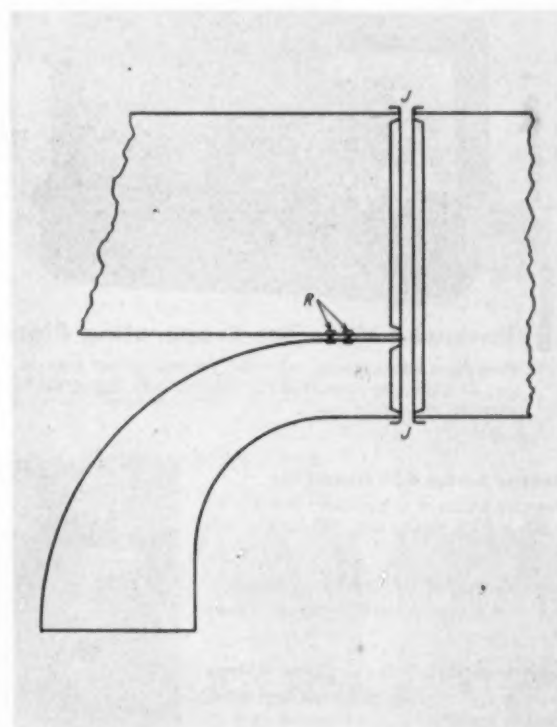
The conventional duct and hood dust removal system, the most common type, can best be constructed along lines of the "step-up" principle (Fig. 2) where each take-off for a branch duct is made from the main duct system. Where each new branch duct joins the system, the trunk duct is enlarged so that the air velocity will remain the same. The branch duct take-off fitting must be made so that the entire width of the trunk line is used. This layout will permit the fabrication of the take-off for a smooth, low resistance connection.

Two methods can be used for connecting this fitting to the trunk line. Fig. 3 shows the branch fitting attached to the trunk line with rivets at points R on both sides of the duct, and across the bottom. Point S is a 180 deg rolled lip on the branch duct, into which the smaller section of the trunk line is forced as it slides into the larger trunk section. The two trunk sections are held together by short length sheet metal screws, and the joint is taped with corrosion-resistant adhesive tape to provide an airtight joint.

Fig. 4 shows the branch duct riveted to the bottom of the small trunk (points R). Then the two main sections are drawn together and held in place by standard covering strip. This strip should also be taped with corrosion-resistant adhesive to provide the airtight joint required.



3 THE BRANCH FITTING can be attached to the trunk line with rivets at points R on both sides of the duct and across the bottom . . .



4 OR CAN BE riveted to the bottom of the small trunk section (points R), after which the two main sections are drawn together and held by covering strips

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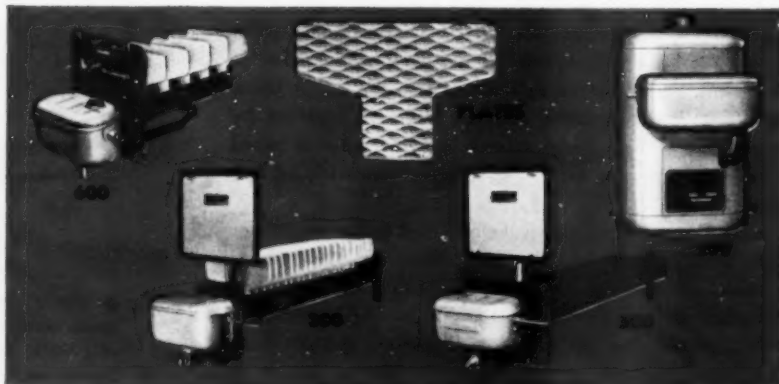
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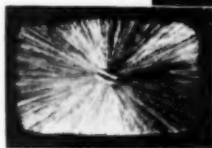
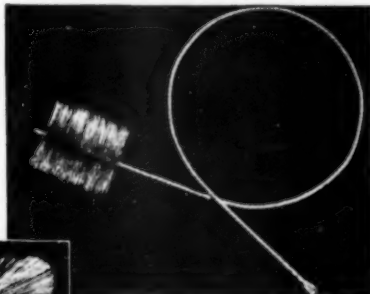
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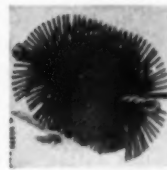
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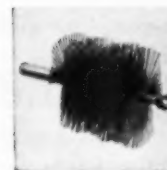


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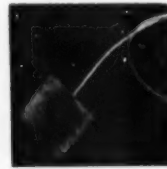
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YOUR BUSINESS AND THE LAW



Partial Acceptance Invalidates Contract

By Albert W. Gray

The minds of all involved parties must meet on the essential features of a contract if it is to remain valid. A general contractor's counter proposals on a job bid, for example, must be explicitly accepted by the subcontractor if the latter is to be held responsible for the work specified

A HEATING and air conditioning firm wrote a general contractor in reference to the installation of equipment, in part, "We wish to quote a price of \$35,851.00. We are using . . . (manufacturer's name) . . . equipment throughout with the exception of the fan and coil sections."

The specifications on which the estimate of this subcontractor was supposed to be made provided, "The compressor shall be of multi-cylinder reciprocating type, slow speed, belt driven," with the further provision, "The evaporative condenser shall be constructed entirely of stainless steel with the exception of fan shaft, wheels and scrolls." However, this was at variance with the offer contained in the letter of the subcontractor, since equipment offered by the manufacturer named would involve a high speed compressor and a galvanized evaporative condenser.

The estimate was used by the general contractor in the preparation of a bid submitted for the construction of a building for which the general contractor was awarded the contract.

Two weeks later this general contractor wrote the heating and air conditioning firm, "We are pleased to advise that you have been approved as a subcon-

tractor for air conditioning and heating for the subject job and to save time we are enclosing the original copy of the subcontract covering this work which we have executed.

"If the subcontract is satisfactory to you, please complete the performance bond and return to us the executed copy of the contract and bond."

In this letter was enclosed a proposed contract signed by the general contractor which provided that this subcontractor should be bound by the terms of the original contract of the general contractor in so far as the same pertained to the work and materials embraced in the subcontract, thus rejecting the offer of the subcontractor of a high speed compressor and galvanized evaporative condenser, instead of the low speed compressor and condenser of stainless steel in the original specifications.

The air conditioning subcontractor neither signed nor returned the proposed subcontract, but advised the general contractor that he could not meet the specifications of the original contract. The following month the general contractor wrote that he would hold this heating and air conditioning firm responsible for any increased cost accruing through its failure to carry out its agreement and three months later that letter was followed by:

"We made a diligent effort to secure a satisfactory subcontractor for the work of heating and air conditioning when you withdrew your accepted offer.

"We received one informal bid for the work in an amount slightly more than \$40,000, and another firm bid in the amount of \$33,617. As your offer which we accepted and which you were advised we would use in our bid, was for the amount of \$35,851, you are indebted to us for the difference of \$2,766, for which we would be glad to have your remittance."

Contract Invalid without Meeting of Minds

This was followed by a lawsuit brought by the general contractor for the recovery of this difference. The case recently came before the Supreme Court of the state involved, which said in its decision in favor of the heating and air conditioning contractor:

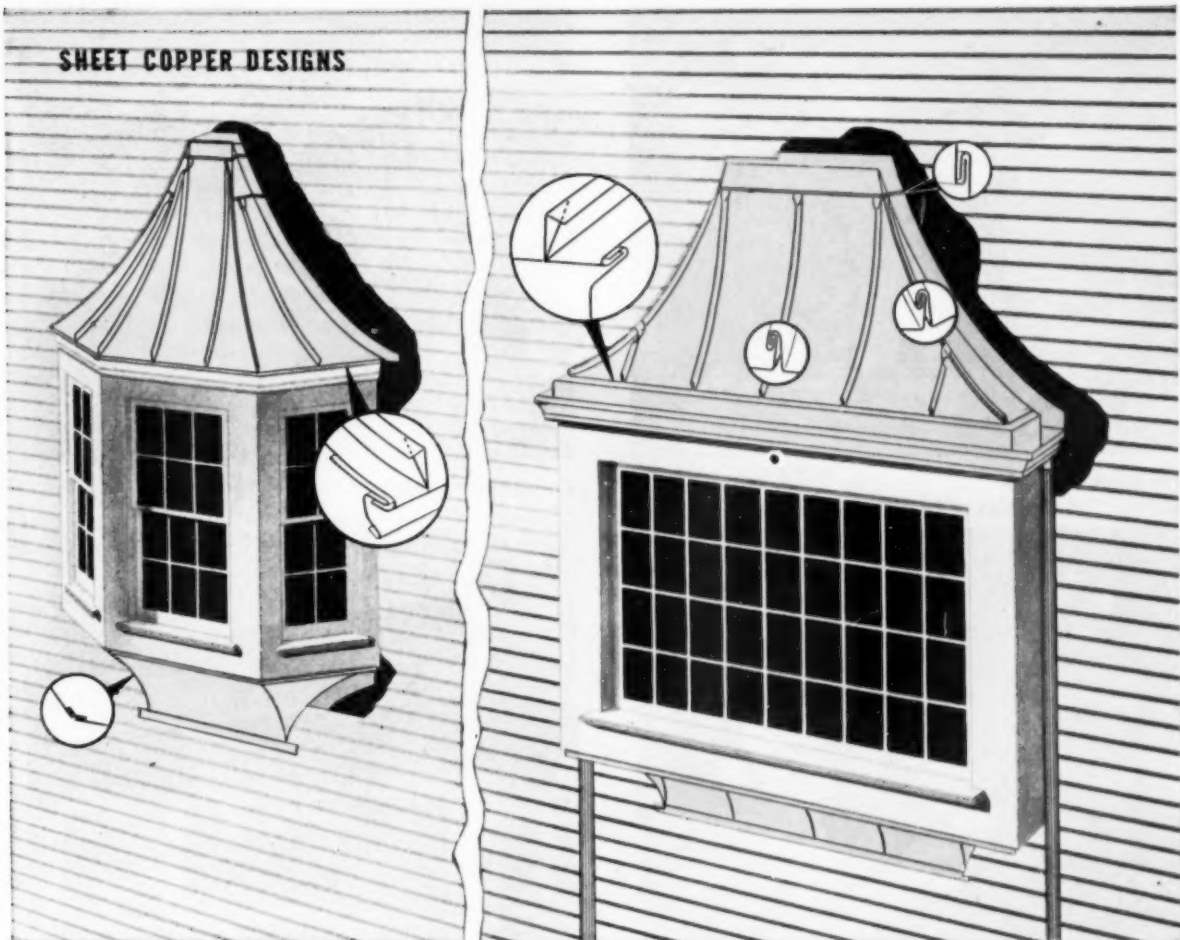
"The rule is that the minds of the parties must meet as to the essential features of a contract. The letter of the general contractor with the enclosed document which he supposed to be the acceptance of the bid, specifies that the subcontractor must comply with the specifications.

"That was in effect a counter proposal eliminating the equipment of the manufacturer specified by the subcontractor. For it to be a contract therefore, the subcontractor must accept the counter proposal. These two communications do not constitute the acceptance of a bid in clear and uncertain terms.

Albert W. Gray, author of this article, has had twenty years experience as an attorney in the courts of New York City. He has written widely on legal matters and is the author of "The Family Legal Adviser."

(Please turn to page 126)

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Bonuses for Job-Time Saved

By Byron B. Courtney
Johnson-Hilliard, Inc.

THE WARM AIR heating firm of Johnson-Hilliard, Inc., Kingsport, Tenn., has in operation an employee bonus plan, adopted two years ago, which is designed to bring about higher employee morale, faster installations, improved employer-employee relations, increased profits for the company and more take-home pay for the workers themselves.

The basic idea of this bonus plan is simple. If a job is completed in less time than was estimated in the bidding for the heating or other contract, the men doing the work get paid for the hours saved.

Almost all furnace installations made by this company are contracted for a definite figure before any work is begun. Thus, the mechanics, as well as helpers, electricians, etc., have a chance to make a bonus. The plan is not restricted to heating work, but is extended to cover all other jobs taken by the company, such as air conditioning, sheet metal work, etc. Almost every week, each employee of the company has an opportunity to add to his regular paycheck.

The amount of materials used on any job is the direct responsibility of the salesman, and in no way affects the bonus plan. Nor is the mechanic held responsible in any way if there is any unforeseen lost time on a job due to breakdowns, power failures, etc. If the time is

over the estimated hours, the men are still paid at their regular hourly rate.

Computing the Labor Time

As the first step in a typical furnace job, a company salesman and a mechanic call at the home of a prospect to get all measurements, data, information and plans. The salesman then returns to the shop office to calculate the heat loss, furnace size, duct and register size, and to do all the other things necessary before submitting his bid for the job to the home owner. Getting the right sized furnace and figuring the materials are relatively simple, but figuring labor time on a particular job isn't.

Useful in computing the estimated labor time are the files which have been kept on all jobs since the company started in business. When a job is being figured as to probable labor time, an older, similar job is drawn from the files and examined thoroughly. Costs may be different for some materials, but the number of man hours consumed on each phase of the job still will be valid.

If the salesman does not recall a similar job in the records, the chances are that one of the firm's mechanics can remind him of one. Often the mechanic, in the before-bid visit, makes suggestions with regard to past jobs that affect the final estimation of labor to be involved. As can be seen, with all these aids, the salesman can get a fairly accurate labor estimate.

For illustrative purposes, suppose that a bid is submitted for installing a gravity heating system in a five-room brick home with a complete basement. Assume the estimated labor is three days for a mechanic and his helper, and one-half day for the company electrician. The number of hours for each man is multiplied by his hourly wage rate, the total is computed, and the normal overhead and profit margin is added to the total. The labor figure is, of course, added to the materials figure before the bid is submitted.

Let's assume that the firm is awarded the contract. Suppose, also, that the job is completed in two hours of the third day by the mechanic and helper, and the electrician wires up the various controls, etc., in three hours instead of the allotted four, which is entirely possible. The estimated total hours were 52; the actual hours are 39 — 13 hours short of the estimated time. This time is, then, the "bonus" time.

How the Bonus is Divided

How is this bonus divided? The percentage rule is used. It can easily be figured that the mechanic and the helper each did 46 per cent of the work, and the electrician, 8 per cent, as far as man hours are concerned. Therefore, in round figures, the mechanic and his helper each would receive six additional hours' pay, and the electrician, one hour's pay. Each man made 25 per cent more than he would have ordinarily, on a routine time and material job. Also, each was free to start a new job 25 per cent more quickly than was expected.

As for the company, it has made a bonus, too. The margin of profit calculated on the bonus hours that

weren't needed to complete the job is the company's bonus. Indeed, the plan benefits all concerned.

The larger the job, the more complicated it is to compute the bonus. On a recent heating job, a total of 150 man hours was estimated. This time was figured proportionately among three mechanics and two helpers. Here is how the actual percentages worked out:

Mechanic A	38 hours, 32% of time
Helper A	37 hours, 32% of time
Mechanic B	21 hours, 18% of time
Helper B	18 hours, 15% of time
Mechanic C	4 hours, 3% of time

Total time 118 hours

Therefore, the total bonus time on this job was 32 hours, and the time saving was about 20 per cent. Figuring the time to the nearest quarter-hour, each man made:

Mechanic A	10 $\frac{1}{4}$ hours' pay
Helper A	10 $\frac{1}{4}$ hours' pay
Mechanic B	5 $\frac{3}{4}$ hours' pay
Helper B	4 $\frac{3}{4}$ hours' pay
Mechanic C	1 hours' pay

Don't "Cut Corners"

As a rule the men themselves do not receive any figure connected with a particular job other than the estimated man hours. To date there is not a single job on record where the workers have "cut corners" or done inferior work in order to speed the job to completion.

Most of the mechanics have been doing heating and sheet metal work for at least 15 years; some, much longer. They are all well aware that it doesn't pay anyone to try to get away with sloppy work or improper installations of heating equipment. As a result, the proportion of callbacks and service calls to total heating installations is very low.

Once a job is under way, however, the furnace man will frequently come up with an idea that will speed the job right along. For instance, the mechanic will work out a way to reduce the number of transition pieces specified, saving himself time and the company materials.

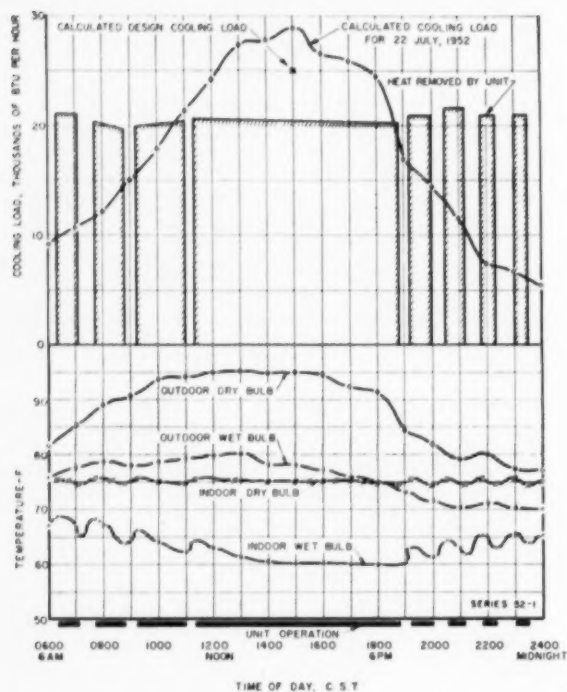
Plan is a Success

While all the employees of Johnson-Hilliard, Inc., could be trusted implicitly to give their best efforts to their work long before the plan was adopted, the company feels there is no better way to increase productivity than prospects of more take-home pay. At a meeting of the employees and management just before the plan went into effect, it was explained fully to the men that, "If the shop makes more money, it is the company's intention that the men should and will make more money also!" The plan has been a success ever since.

Shop foreman Fred Tomlinson, who is in complete charge of all work in the shops (salesmen supervise furnace installations on the job) remarked, "When a furnace man and his helper are working here in the shop, getting out the ductwork for a job with a possible bonus, they don't need any prompting. They rush in, make up their duct and fittings as they need them, and rush right out again!"

ACTUAL COOLING LOADS —

(Continued from page 75)



THE CYCLICAL variations in room-air temperature (measured at the room thermostat) were small

and consequently the apparent time lags are affected by factors other than the exterior-surface temperatures, the heat transfer from the interior surface of the room to the room air is a function of the interior-surface temperature, the film co-efficient along the surface, and the room-air temperatures. Thus, the factors which affect the surface temperatures and the time at which their maximum values occur are important only insofar as they facilitate prediction of the maximum values and the times of their occurrence. The design procedure now in use does not predict the time of occurrence of the maximum interior-surface temperatures.

Actual Heat Flow Differs from That Calculated

Comparisons of the measured and the calculated values of the heat flow through the walls and ceiling of the Residence show that in general the measured value was less than the calculated value when the wall was not exposed to direct solar radiation. This discrepancy was attributed to the difference between the measured and predicted time lags. The same general conclusions were drawn from studies of the heat flow through the north and east walls of the Residence. It should be noted here that the ceiling-attic-roof combination was treated as a flat roof in calculating the cooling load because the design procedure applied only to horizontal flat roofs.

The measured heat flow through the west wall was

considerably greater than the calculated heat flow. The discrepancy was greatest during periods of greatest solar load on the wall. Although it would appear that the measured heat flow became greater than that calculated at 9:00 a.m., before the sun imposed direct radiation on the wall, the difference between the actual and predicted time lags indicated that if the calculated load were shifted to three hours earlier, the calculated and actual loads would be the same at approximately 1:00 p.m. This would be shortly after the time at which the sun could begin to radiate directly to the west wall. That the maximum measured flow — 3.95 Btu per hr (sq ft) — was 50 per cent greater than the maximum calculated heat flow — 2.53 Btu per hr (sq ft) — can be attributed to the direct solar radiation on the west wall of the Residence and apparent discrepancies between the actual sol-air temperatures and those tabulated in the ASHVE Guide.

The measured heat flow through the south wall of the living room was less than the calculated heat flow until after 5:00 p.m. The calculated heat flow was that for an unshaded south wall having a U value of 0.06 Btu per hr (sq ft) (F). Although the discrepancy between the maximum calculated and the maximum actual heat flows was less than 20 per cent, it is obvious that the measured heat flow would have been considerably greater had the wall not been shaded by the overhang of the eave. As a consequence it is somewhat doubtful if the calculated load would be greater than that measured on an unshaded south wall.

How the Unit Operated

As indicated in the chart (above), the cyclical variation in room-air temperature (indoor dry bulb) was small. This small variation was characteristic of the conditions which were maintained in all of the first-story rooms during the cooling season, even though the indoor dry bulb temperature shown in the chart was measured at the room thermostat. When intermittent operation of the unit occurred, the variation in room-air temperature amounted to about 1 F between cycles of operation. However, when the unit operated for prolonged periods of time, there was no appreciable variation in room-air temperature experienced.

The difference in room-air temperature between rooms in the Residence and at the thermostat was slightly greater than 1 F as maximum, depending upon the time of day and the outdoor weather conditions experienced. For instance, during periods of peak load, the room-air temperatures at the sitting level in the south bedroom and in the kitchen-dinette were greater than those experienced in the other rooms of the Residence. The higher room-air temperature in the south bedroom was attributed to the relatively large cooling load imposed upon this room through the ceiling and through the south and west exposures as compared with the air supply to it through the one high sidewall register, and that in the kitchen to the fact that the air was delivered to the kitchen-dinette

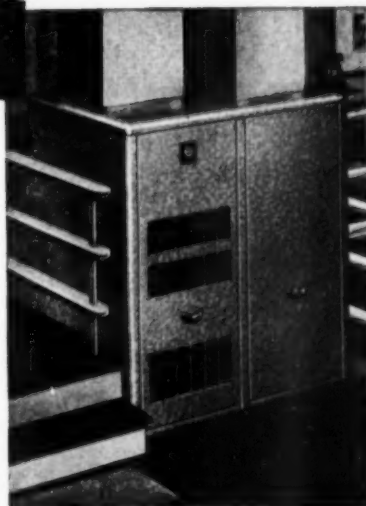
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through one register located in the west wall of the dinette. The room-air temperature in the bathroom and in the north bedroom, on the other hand, was lower than that at the thermostat. This was attributed to these rooms being smaller than the south bedroom and the air supply being more adequate as compared to the load imposed upon these rooms.

The day selected for comparing the operation of the equipment against the calculated load was July 22, 1952. On this day, the maximum outdoor dry bulb temperature was 95 F and the maximum outdoor wet bulb temperature was 80 F, 4 F greater than the design wet bulb temperature of 76 F.

The actual heat removed from the Residence during the 18 hour period was less than the calculated heat removed would indicate. Integration of the areas under curves showing heat removed by the cooling unit indicates the total to be 281,000 Btu for the period. The predicted heat removal, obtained by integrating the area under the calculated cooling load curve, was 326,700 Btu, 16 per cent greater than that actually removed.

A breakdown of the comparison into periods of the day is of more significance than comparing the total heat removal. For convenience, the test period was divided into three parts: the morning period when the cooling load was increasing, the period of maximum cooling load during the hottest part of the day, and the period when the cooling load was decreasing during the evening. Details of the comparison are summarized in Table 2.

The water-flow rate through the condenser varied from 135 to 140 gal per hour of operation. The temperature of the water entering the condenser increased from 62 F at the beginning of the cooling season to 65 F at the end of the season, and the water temperature rise through the condenser varied from 22 F to 25 F, depending upon the length of operation. The water cost for the 30 day period beginning June 15, 1952 was \$16.52. This cost was based upon the local rates in Urbana, Illinois, and was computed without allowing for normal household

Table 2—Comparison of Measured and Calculated Heat Removal (in Btu) by Unit for July 22, 1952

	6:00 a.m. to 11:00 a.m.	11:00 a.m. to 7:00 p.m.	7:00 p.m. to midnight	Total
Measured	73,900	153,500	53,700	281,100
Calculated	71,200	204,000	51,500	326,700
Percentage Difference (based on measured value)	-3.7	+32.9	-4.1	+16.2

consumption, since the Residence was unoccupied during this study. On this basis the average water cost for the month was 37.1 cents per hundred cu ft, and the total consumption was 37,126 gal (4455 cu ft).

The compressor consumed 1.8 to 1.9 kw, and the power consumption for the blower motor was approximately 0.2 kw. For the same periods mentioned above, the 30 days beginning June 15, 1952, the total power consumption was 544 kwhr by the compressor and 145 kwhr by the blower motor. The power cost for this period, based on local rates and making no allowance for normal household consumption, was \$15.86. The average power cost was 2.3 cents per kwhr for the total consumption of 691 kwhr.

The compressor operated a maximum of 16.2 hr for one day during this same 30-day period. This was also the maximum operating time experienced during the cooling season. The total number of degree hours above 75 F (outdoors) was 4065, or an average of 136 per day for the month. The maximum for one day was 318 degree hours above 75 F and the minimum was zero. The operating costs for the day of maximum operation were 82 cents for power and \$1.00 for water. For an average day during this period, the power cost was 52 cents and the water cost was 54 cents. These values are based on the average rates mentioned previously.

[This paper reports one phase of a comprehensive investigation conducted in Warm-Air Heating Research Residence No. 2 under the terms of a cooperative agreement between the National Warm Air Heating and Air Conditioning Association and the Engineering Experiment Station of the University of Illinois. These results will ultimately comprise part of a bulletin of the Engineering Experiment Station.]

MONEY IN REMODELING —

(Continued from page 88)

he wants them. Mr. Wright has found that many people are interested in just what goes into the cost of an installation, and appreciate receiving this information.

A good percentage of the firm's air conditioning business is in the form of evaporative coolers. Colton is located in a relatively dry climate where these units prove effective. Refrigeration systems are also installed when the customer wants that type. Customers frequently desire to have evaporative coolers mounted on the roof of their homes, but don't have sufficient funds for the installation. In these instances, Mr. Wright suggests that they mount the unit in a window for the first season and

make the more permanent installation the second year. By handling it this way, he doesn't lose out on his sale and the customer gets what he wants.

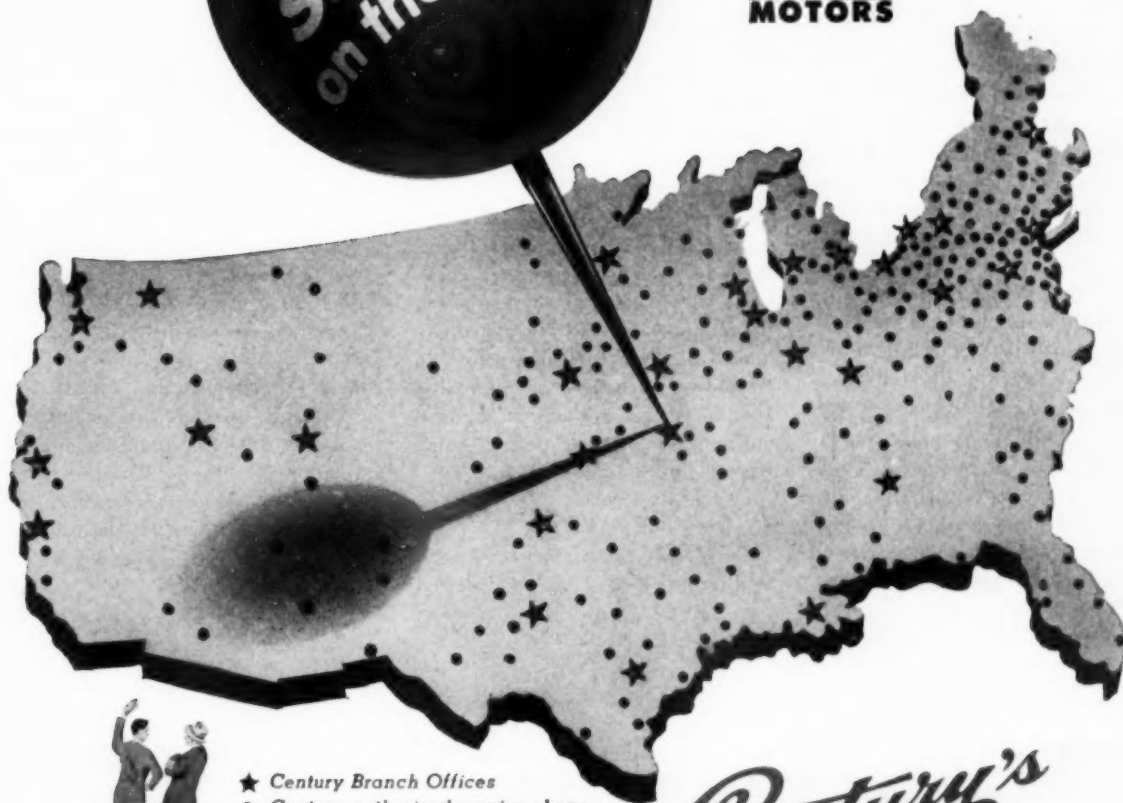
Mr. Wright has realized very real economies by equipping his new manufacturing department with a 10 ft power shear and an 8 ft power brake. These machines are used for making gravel stop, valleys, and vents.

An advantage of doing this fabrication on the premises is the greater ease of scheduling work. Stock can be made up ahead of time whenever current contracts aren't sufficient to keep everyone busy. Most of the 16 men on the firm's payroll have been working for Mr. Wright for a number of years. None of them has ever lost any time due to layoffs, because a constant work load is maintained.



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COOLING CONTROLS —

(Continued from page 63)

two-position, floating, and proportioning models.

The two-position thermostat is the common type having a single pole, single throw switch which is either open or closed. This type is used to initiate the starting and stopping of the heating or cooling system.

The floating type thermostat has a single pole, double throw switching action. One circuit is made on a rise in temperature, the other on a fall in temperature. This device is used primarily to open or close motorized valves and dampers. The exact position between full open or full closed which the valve or damper assumes depends upon the length of time during which either contact remains closed. Thus, the controlled device can "float" between the full open and full closed positions.

The proportioning thermostat is also used to operate motorized valves and dampers, but its operation differs from the floating type of control in that the position of the valve or damper is exactly determined by the

relative position of the thermostat element. Thus, a thermostat having a 2 deg differential will for each half degree of temperature change cause a valve or damper to travel one-quarter of its total travel.

Thermostats are being offered today in a wide variety of contact combinations for heating and cooling duty. They also are available with timing devices for night time resetting or for resetting by outside temperature indicators. Sub-bases with various switching combinations are available which are especially convenient for air conditioning control.

6 Humidistats

In place of the vapor or liquid-filled bellows or the bimetallic element which actuate the thermostat, the humidistat usually uses sensitive human hair which changes length in response to changes in humidity. Humidistats are available in the two-position, floating, and proportioning types as are thermostats.

7 Pressure Cutouts

Cutouts are pressure switches actuated through bellows by the high and

low pressures in the refrigerant system. They are connected electrically in series with the thermostat in the compressor starter control circuit and serve to stop the compressor motor in case of abnormally high pressures (as caused by failure of the condenser to cool properly) or low pressures (as caused by failure of the evaporator to supply the necessary load). The operating pressure and differential are usually adjustable. Like motor starters, pressure switches should be of the manual reset type, as this will call attention to the need for investigation into the cause of the abnormal pressure.

The selection and application of controls involve a rather specialized field of knowledge. A complete control system is a necessity for the satisfactory operation of an air conditioning system, and no system of air conditioning is any better than its controls. Control manufacturers' engineers are often quite helpful in suggesting control arrangements. However, it should be remembered that simplicity is often the key to successful control of summer-cooling systems.

10 STEPS —

(Continued from page 69)



9 *Treat the people you meet as if they are just about to sign a contract with you.*

The dealer should cultivate a friendly, helpful air toward the milk-

man, the mailman, the people he meets at home, in business, or while on hunting trips. This will be his biggest help in winning new customers, and it also will help him from a personality standpoint.



10 *In business dealings, operate on the basis of the Golden Rule.*

Doing unto others as you would have them do unto you not only is good ethics, it's good business. The dealer who sets his customers an example of fairness in his contacts with them usually is treated fairly in return. His shop gets a reputation for dependability and stability which keeps the old customers faithful and is the most important factor in bringing in new business.

These 10 steps are intended to help the dealer avoid misunderstandings. A little care and planning, plus the right attitude, are needed to do the job. The dealer must interact with people so that they will appreciate his services, will call on him for future work, and will recommend him to others. He can, and should, modify or add to these steps as his experience indicates new approaches to customer relations.

for every 1/100" of excess draft eliminated by Field accuracy there is a 1% savings in fuel*

How much does an inaccurate draft control cost? It can add up to 5% to a consumer's fuel bill every year because an inaccurate control commonly permits up to 5/100" of excess draft. And that's why the superbly fine Field control actually costs least of all. Its watch-like accuracy permits a hair-line instrument setting that eliminates excess draft — and fuel waste — yet never restricts minimum draft needs. And the patented Field features — listed below — assure you that this precise setting will be maintained. A score of years and 10,000,000 installations have proved that there is no substitute for Field quality.

*Fuel waste without any draft control runs up to 30%; with an inaccurate control 9% fuel waste is common.



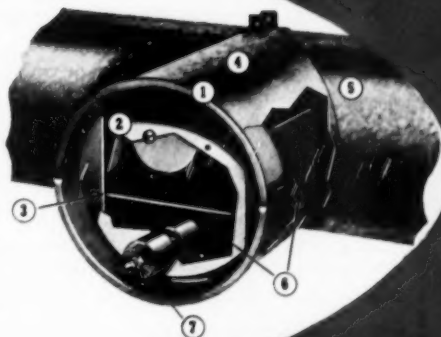
The long life and trouble-free service of a Field Draft Control is assured by heavy construction and correct design. Note specifications shown in drawing.

... there's no way there is no substitute for the superb accuracy of a Field Draft Control

field

DRAFT CONTROLS

- 1 — Made of heavy materials — Field controls last longer.
- 2 — Balanced at factory — Eliminating weight variations which could affect control's accuracy.
- 3 — Rocker type hinge pin — Quickly responsive, no friction. No sticking.
- 4 — Long Collar — No warping or clogging due to heat or soot, no service calls.
- 5 — Free smoke passage — A Field Control never blocks the flue.
- 6 — Side wings and fitted gate — More accurate because opening in control increases more uniformly.
- 7 — Factory adjusted — Set to maintain .06" draft until instrument setting is made.



FIELD CONTROL DIVISION, A. B. SEARS & CO., CHICAGO, ILLINOIS

SOLE AGENTS: CHAS. E. BROWN & SONS, INC., 100 N. BROAD ST., NEW YORK, N.Y. 10038
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AND AIR CONDITIONING UNITS

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You make a greater profit on AMER-glas filters because of their *proved* selling power. It's a big profit business, and it means big volume, too! Four out of five warm air furnaces now being installed are forced air units . . . and leading domestic air conditioning units come equipped with AMER-glas filters. This means you have red-hot prospects . . . and steady, repeat business . . . for AMER-glas filters throughout the year! Check the profit opportunity there is in your trade area, then do something about it.

Display, sell AMER-glas filters—biggest profit builder in the big air conditioning and furnace filter market.

You can expect the best from



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COMPANY, INC.

AMERICAN AIR FILTER CO., INC.

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Please send me complete information on AMER-glas Replaceable Air Filters. Show me proof of the profits!

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SELL THE AIR FILTERS . . . YOU'D BUY YOURSELF!



HOSPITAL-WHITE — AMER-glas filters look clean, out-sell other brands on eye appeal alone.



SMOOTH TO TOUCH—no prickly slivers, unpleasant odor or greasy feel.

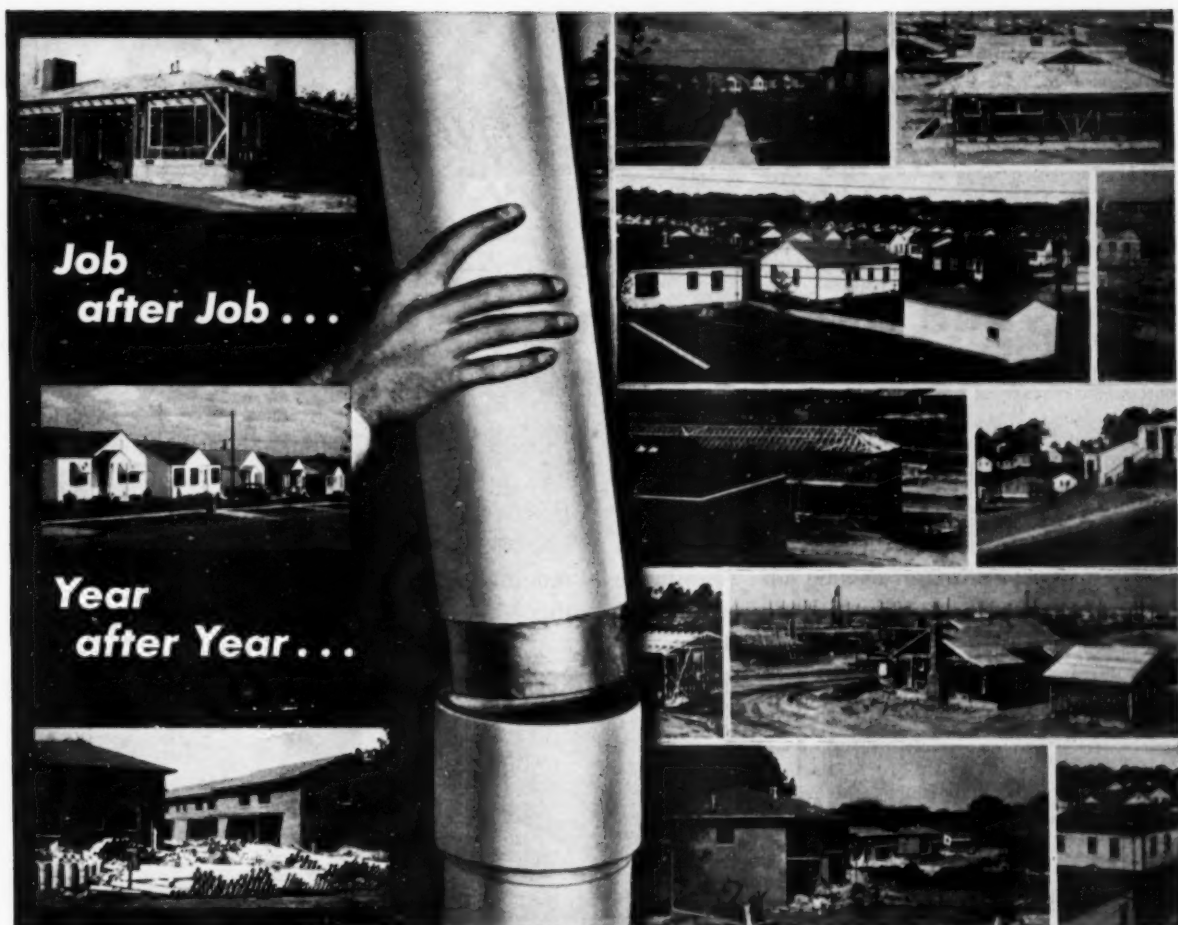
FILTER



CATCHES "NUISANCE" DUST, holds it inside where it can't pack on the filter face and clog air passages.



AAF BACKS YOU WITH A COMPLETE SALES PUSHER KIT—everything you need for building business.



... Contractor after Contractor Selects Corrosion-resistant Transite Flue Pipe

YES, Transite* venting installations keep right on multiplying! Over 70,000,000 feet of Johns-Manville Transite Flue Pipe are now in service. More contractors than ever are making this popular asbestos-cement product, their Number One flue pipe selection.

Included in codes of cities from coast to coast, J-M Transite Flue Pipe is the *only* pipe that has been continuously listed by Underwriters' Laboratories since 1932 for use as a flue and vent pipe for domestic gas-burning equipment.

Non-metallic, it cannot rust . . . tough and strong, it will not deform. It is light in weight, permits simplified handling, speeds installation and requires minimum bracing.

Available in oval and round pipe—each with a full line of fittings—Transite Flue Pipe allows more flexible and economical venting design, saves time and money on the job. For full details write for Booklet TR-13A, Johns-Manville, Box 60, New York 16, New York. In Canada, 199 Bay Street, Toronto 1, Ontario. *Transite is a Johns-Manville registered trade mark



Johns-Manville TRANSITE FLUE PIPE

FOR VENTING DOMESTIC GAS BURNING APPLIANCES

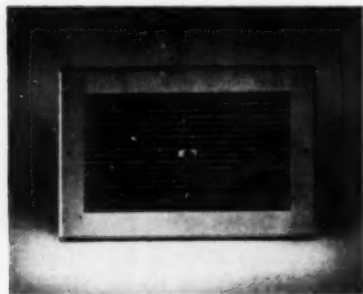
Worth looking into



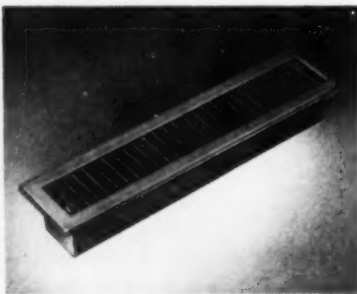
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The new Lima 1953 catalog will help you install extra efficiency this season at no extra cost. With Lima, you assure proper air distribution for best performance in every heating or cooling job . . . and give your customers Lima quality extras that

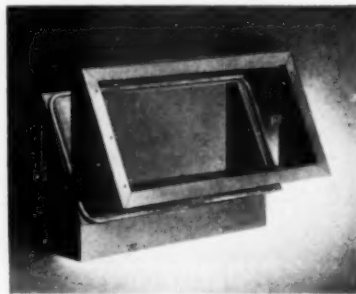
add up to lasting satisfaction. Featuring new products and new sizes, the new Lima catalog gives you more reason than ever to see your Lima wholesaler when ordering diffusers, registers and grilles for the jobs you install this season.



WINTER HEATING OR SUMMER COOLING—The regular heating sizes of Lima Diffusers and Wall Registers have extra sturdy construction and high velocity air handling qualities to make them equally efficient for air cooling. No need to order larger sizes or add auxiliary registers just for cooling.



PERIMETER HEATING OR CONVENTIONAL SYSTEM—Exclusive features of Lima Floor and Wall Diffusers assure top perimeter heating efficiency. Lima Wall Registers—the world's finest—give quick four-way diffusion plus exclusive Lima "Balancing Bell" control. Lima Floor Registers are the strongest and most beautiful you can install.



REMODELING OR NEW CONSTRUCTION—Competitively priced, quality Lima Diffusers and Registers give you the same extra construction features and performance advantages for your remodeling jobs as they do for your new house installations. Recent additions to the Lima line, like the Wall-O-Way, are especially suitable for home modernization work.



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Send for your copy of this big new 1953 Lima catalog and new price list. It's free for the asking, and your copy is ready now. Write today, or get it from your local Lima jobber.

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Lima, Ohio

makers of the world's finest diffusers, registers and grilles

sold exclusively through heating wholesalers and manufacturers

You get ALL these Features when you buy PET Drills!

Reserve Power—for the extra-tough job.

Powerful, Continuous-Duty Motors—built in PET's own factory. Dynamically Balanced Armatures—for freedom from vibration.

Six Heavy-Duty Ball and Needle Bearings.

Compact Design—makes hard-to-reach drilling jobs easier and faster.

Aluminum-Alloy Die Castings—for light weight, easy handling.

Forced Ventilation—for cool running.

Precision-Cut, Heat-Treated Gears—for smooth, quiet power flow.

If you want the *best* for your maintenance or production work, take an extra look at the PET Superduty Drill shown here. Check its features! Here's a drill that's made for heavy, continuous duty... with *plus* power per pound... built to *work* right and *handle* right on the job.

Normally you might expect to pay extra for such features—in the form of "optionals" that jack up your cost. But that's not true of PET Drills! All these features are standard in the PET Superduty line... and they're available to you at a standard drill price! That's why the coupon below can save money for you. For free catalog and name of your nearest PET distributor, *mail it today!*

NOW...you can get the RIGHT DRILL for YOUR job!

PET Superduty Drills are available in 54 distinct models and 3 capacities: $\frac{1}{4}$ ", $\frac{3}{8}$ " and $\frac{1}{2}$ ". Your choice of pistol or saw-type grip. With such a broad line, you don't have to compromise on a

drill that's "almost" right! You can choose *exactly* the drill you need for your job. The PET Superduty line includes drills meeting U. S. Government and military specifications.



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WHAT ASSOCIATIONS ARE DOING



HAVING FUN at the 19th hole during the Fox Valley Association field day are (l. to r.) S. L. Ericson, Don Glossop, Jack Rubo, Fred Lamp, Laurie Hecht

Fox Valley Group Has Annual Field Day

THE FOX VALLEY FURNACE and Sheet Metal Contractors Association held its 19th annual field day at the St. Andrews Golf Club, St. Charles, Ill., on July 29, with 112 contractors and their friends attending. The main events were horseshoe pitching, 19 holes of golf, and a steak dinner. Winners of the horseshoe pitching contest were Bob Lorenz and Jerry O'Mara of the Chicago Furnace Supply Co. Prizes for low gross scores for 18 holes of golf were awarded to Fred Nolting, West Side Hardware Co., for the contractor group, and Charlie Bennett, Armstrong Heating Supply Co., for the guest group. There were no awards for the 19th hole, but as the photograph above illustrates, there was lots of fun for all.

After the dinner, many of the guests made short extemporaneous talks which brought out how this association has contributed to the development of the warm air heating and sheet metal industry. Some of its outstanding achievements are:

1. A progressive furnace installation code resulting in better heating installations.
2. A program of independent schools where employees have received training in selling, merchandising, service and installation.
3. The providing of speakers for national and state conventions.
4. The development of new designs resulting in greater acceptance of sheet metal for applications formerly using other materials.

Committees and their members who were active in the event are: arrangements, George Bushman, Bill Klinkey, Clayton Evelien and Joe Strotz; registration, Clayton Evelien, Fred Nolting, Phil Ries and Andy Lind; horseshoes, George Bushman and Don Glossop; golf, Jack Stowell and Art Warren; and reception, Joe Strotz, Fred Lamp, John Rubo, Bill Klinkey and Burrell Conover.

Toledo Apprenticeship Program in Full Swing

APPROXIMATELY 100 boys received certificates of graduation at the fifth annual apprenticeship banquet sponsored by the Toledo Area Council of Joint Apprenticeship Committees. Seventeen of the boys were graduates of sheet

metal apprenticeship courses and are now qualified journeymen. The guest speaker was Asa A. Knowles, president, University of Toledo. John R. Newland, regional director, U. S. Bureau of Apprenticeship, presented the certificates of completion.

Under new government regulations covering Korean veterans, employers must keep complete reports on the progress made by apprentices and submit them monthly in order that the apprentices may get subsistence pay. The record shows how much time the apprentice puts in on gutter work, on layout and on air conditioning; how much time he spends at school and at the shop; etc.

Gas Company Entertains Columbus Contractors

MEMBERS OF the Sheet Metal Furnace and Air Conditioning Association of Columbus, their wives and children were guests at a party given recently by the Ohio Fuel Gas Co. Entertainment was followed by a dinner.

What Are Purposes of an Association?

ACCORDING TO a recent bulletin from the Michigan Heating and Sheet Metal Association, the four primary purposes of an association are: 1) to pool the ideas, effort and money of its members in order to promote its particular industry; 2) to provide facilities for meetings; 3) to make available to its members the benefits of insurance programs; and 4) to collect and distribute information of interest to the contractors and dealers who make up its membership.

New York Contractors Urged to Advertise

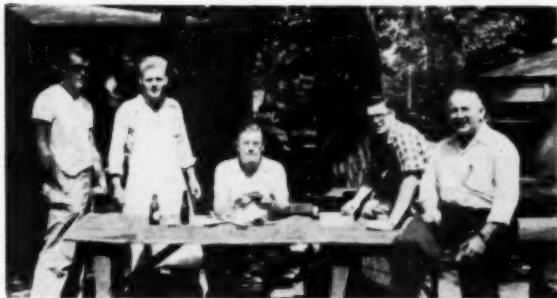
A RECENT ISSUE of the *Institute Ticker*, published by the Roofing and Sheet Metal Crafts Institute, points out that contractors must advertise to increase business. The *Ticker* suggests newspaper advertising, which is comparatively inexpensive and yet offers good coverage in a restricted area. However, the publication says, the contractor should remember that in order to get the most from his advertising he must give careful attention to the construction of his ad. This should be simple, easy to understand, and should appeal to the readers' needs.

Appoints Area Adviser to SMCNA Committee

I. C. Mock, president, the Roofing and Sheet Metal Contractors Association of Georgia, has named J. D. Faulkner, Jr., as Georgia's area adviser to the labor relations committee of the Sheet Metal Contractors National Association. Mr. Faulkner is also currently serving as chairman of the Georgia association's labor relations committee.

Jim Welch, director of the Valdosta, Ga., district, presented a detailed report on insurance coverage in a special study compiled for SMCNA. Members who failed to read his report may write J. D. Wilder, executive secretary of the national association, for a copy.

W. M. Jones, Jr., chairman of the architect relation committee, reports growing activity on the part of his committee in carrying out its duties of cultivating closer relations with architects. According to Mr. Jones, public relations activities will not be confined to Georgia, but will extend to other parts of the country as well.



PROGRAM COMMITTEE for the Furnace, Air Conditioning, and Sheet Metal Institute's annual picnic included (l. to r.) Wm. Tippet, R. L. Tippet, Marvin Lawrentz, Ray Guenther, and Tom Novak

Contractors Attend Annual Picnic

EACH SUMMER, towards the end of July, the members of the Furnace, Air Conditioning and Sheet Metal Institute of Chicago arrange with the weatherman to provide ideal weather for their annual picnic. This year the day selected was July 26, and more than 200 contractor members, their families and friends, gathered at National Grove on the banks of the Desplaines River to test their skill at baseball, horseshoe pitching, racing, and other sports.

The picnic committee consisted of Ray Guenther, chairman, Harry Campbell, Dale Carr, Emil Genc, Rudy Guenther, Carl Hansen, Tom Novak, Rollin Tippet, Sr., and Rollin Tippet, Jr. Mrs. Barbara Tippet and Mrs. Anita Guenther handled affairs for the Ladies Auxiliary.

SMCNA Officers Welcome New Members

A. J. SABATHNE, president, and J. D. Wilder, secretary, Sheet Metal Contractors National Association, recently welcomed a new Pennsylvania group — the Sheet Metal & Roofing Contractors Association of Pittsburgh — into membership in the national association. Members of SMCNA's labor relations adjustment committee, including W. A. Kuechenberg, D. E. Shytle and R. S. Felhaber, were guests of the chapter.

In charge of the welcoming ceremonies for a new chapter in Marshall, Mich., the Five Cities of Michigan Chapter, were Secretary Wilder and Dee Cramer, first vice president of the national association.

Indiana Group Sponsors Indoor Comfort Schools

PRINCIPAL SPEAKER at the midyear district meeting of the Sheet Metal and Warm Air Heating Association of Indiana was John Collins, civil defense director for Vanderburg county, who spoke on "Do's and Don'ts in Case of Major Disaster".

The association's department of public information

Coming Events

Nov. 9-12 — 8th All-Industry Refrigeration & Air Conditioning Exposition, Public Auditorium, Cleveland. Sponsored by Refrigeration Equipment Manufacturers Association. W. A. Siegfried, General Chairman, 1509 W. Liberty Ave., Pittsburgh 26.

Dec. 2-3 — National Warm Air Heating and Air Conditioning Association, Annual Convention. Hotel Cleveland, Cleveland. George Boeddener, Managing Director, 145 Public Sq., Cleveland 14.

Dec. 7-9 — National Heating Wholesalers Association, Inc., Annual Convention. Conrad Hilton Hotel, Chicago. C. Stuart Rambo, Executive Secretary, 27 E. Monroe St., Chicago 3.

Feb. 4-5 — Sheet Metal and Warm Air Heating Contractors' Association of Indiana, Annual Convention. Hotel Severin, Indianapolis. Frank E. Anderson, Executive Secretary, 439 S. 17th St., Terre Haute, Ind.

Feb. 24-25 — Michigan Heating and Sheet Metal Association, Annual Convention. Pantlind Hotel, Grand Rapids. N. J. Biddle, Secretary, 3035 E. Grand Blvd., Detroit 2.

has conducted a number of indoor comfort conferences in various sections of the state. Meetings have been held so far in Greensburg, Bloomington and Muncie.

Carolinas Contractors Arrange 1954 Convention

SITE SELECTED for the 1954 convention of the Carolinas Roofing and Sheet Metal Contractors Association is the Grove Park Inn, Asheville, N. C. Dates chosen are June 17, 18, 19 and 20. W. H. Arthur, Jr., was appointed to head the arrangements committee.

Chicago Golf Association Holds Tournament

THE CHICAGO WARM AIR Golf Association meets three times each summer. The second get-together was recently held at the River Forest Country Club, with 47 members and guests attending. Ray Hubbs, Hubbs-Bingham Sheet Metal Co., was the winner of the trophy prize, with a low net score of 71.

Prizewinners, in order of scores (computed by the adjusted scoring system), were announced by W. J. Pennington, Chairman of the awards committee, as follows:

Low Net

Ray Hubbs — Hubbs-Bingham Sheet Metal Co.
Lester Hunt — American National Bank & Trust Co.
Reid Olson — Barney Olson Co.
George Zoubek — Co-Operative Heating Co.
Robert Vlk — Mechanical Home Systems, Inc.
Charlie Bennett — Armstrong Heating Supply Co.
Len Miller — Crosstown Heating Co., Inc.

(Other association news on page 157)



So You Want Package Units!



Law has
always been
the leading
manufacturer
of this
type unit!

Complete size ranges...to meet

***C. A. C. requirements...** models 8096, 8106, 8126, 8124

You want smart, attractive design—this is it! Sizes to meet your needs! Compact enough to occupy minimum space! Cabinets are assembled with blowers attached! Easily removable access door! Two oversize filters! Quiet, efficient and economical to operate!

- for furnace sizes 18" to 28" bowl
- c.f.m. 600 up to and including 1800
- most efficient filters on the market
- will accommodate a range of from 66,000 to 196,000 btu/hr bonnet output at 100° temperature rise

*C.A.C.

These LAU units are built for Continuous Air Circulation. For full explanation of the principles involved in C-A-C please refer to MAN-UAL 6—from National Warm Air Heating and Air Conditioning Association, 145 Public Sq., Cleveland 14, or write us direct.

Complete Line of Larger Package Units...up to and including 25-inch Blower

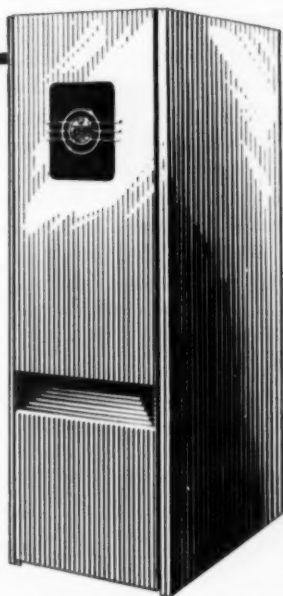
THE LAU BLOWER COMPANY • Dayton 7, Ohio

World's Largest Manufacturer of Warm Air Furnace Blowers

See your dealer or write for catalog page 400

Product of The
LAU BLOWER COMPANY
Dayton 7, Ohio

These Modern Features...



make Chrysler Airtemp easier to sell!



Comfort Zone



When you sell Chrysler Airtemp furnaces you offer features that APPEAL to prospects . . . features that mean years of trouble-free heating. Yet you . . . and your prospects . . . pay no premium for these quality advantages.

- **8-Year Warranty** . . . For extra customer protection, all newly-designed heat exchangers carry an 8-year warranty!
- **Complete Convertibility** . . . New furnace models easily convert from gas to oil or oil to gas . . . yet maintain same BTU output. Ideal where specific fuels are uncertain. You carry lower inventories, too!
- **Bonderized Cabinets** . . . For full rust protection . . . longer life . . . lower maintenance . . . the all-steel cabinets are completely bonderized!
- **Space-Saving Design** . . . Easily installed in closet, utility room or basement . . . passes through standard door openings even when crated!

Get all the facts on nationally advertised Chrysler Airtemp furnaces today. See how YOU can make EXTRA profits by selling summer cooling with these modern furnaces. Mail coupon for complete information on this valuable franchise today!

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AA-9-53

I would like to know more about the Chrysler Airtemp proposition.

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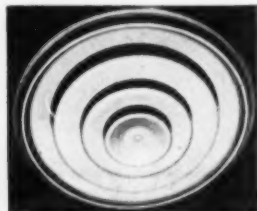
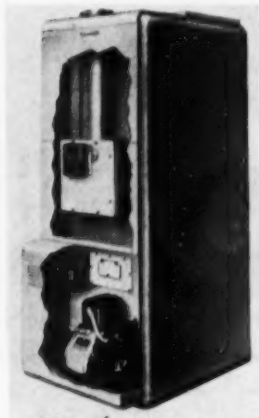
State _____

EQUIPMENT DEVELOPMENTS

The latest information on manufacturers' developments is presented here with brief summaries of the applications of these products. For new literature giving product information which is available see page 184.

Forced Air Furnaces

TWO NEW OIL-FIRED forced air furnaces designed to provide maximum heating with minimum space requirements — Bryant Heater Div., Affiliated Gas Equipment, Inc., 17825 St. Clair Ave., Cleveland 10. Model 314 (illustrated) is a counterflow type designed for perimeter heating in basementless homes. Model 315 is the vertical type, for basement, utility room, or closet applications. It utilizes a UL-approved pressure atomizing type burner that operates within an insulating brick combustion chamber. Available in six capacities ranging from 75,000 to 144,000 Btu per hr, both furnaces are serviced from the front side only. Blowers are rubber-mounted. Both units feature thermostatic control and high-temperature limit control.



Above: Diffuser

Left: Furnace

Circular Ceiling Diffusers

MODEL E circular ceiling diffusers in sizes from 5 in. through 32 in. — W. R. Carnes Co., S. Main St., Verona, Wis. Each size diffuser contains the same number of cones so that appearance will be uniform if various sizes are installed in the same area. The model illustrated is a fixed cone diffuser in which the cone assembly can be set in any one of three positions for horizontal, vertical, or intermediate air pattern. The Model EJ diffuser is a completely adjustable supply unit with which any desired air pattern from horizontal to vertical can be obtained by rotating the center plate. Model ER is a combination supply and exhaust diffuser, used when it is desirable to bring in the supply air and exhaust the room air from the same location.

Round Thermostat

IMPROVED HOME thermostat in the shape of half a sphere — Minneapolis-Honeywell Regulator Co., 2753

4th Ave. S., Minneapolis 8. It will become the company's standard thermostat for home use. The thermostat cover can be removed without tools and painted to match decorating schemes. Among the engineering improvements are an enclosed mercury switch, designed to be dust-free; a bi-metal temperature indicator; and a dial which combines a temperature indicator and the control scale. Since the thermostat can be blended in with the prevailing color scheme, it can be placed in the open, where temperatures can most easily be sensed, the company states.



Thermostat



Fabricator

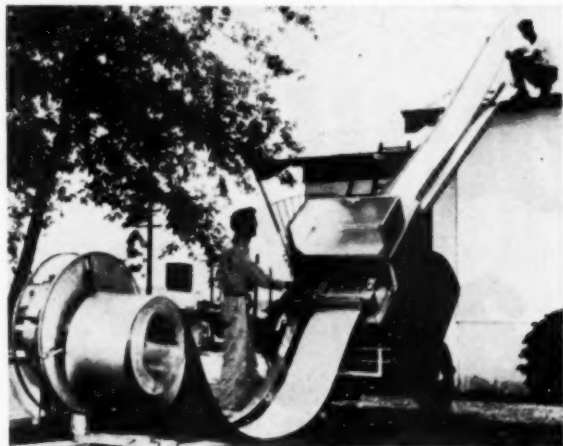
Sheet Metal Fabricator

MODEL 10-AA sheet metal fabricator which punches, notches, and nibbles — Wales-Strippit Corp., 345 Payne Ave., North Tonawanda, N. Y. The improved head is designed to operate with a minimum of vibration and noise at 165 strokes per minute for single hole punching and for nibbling. There is rapid interchangeability for the various operations, and operators work from blueprints or operation sheets without requiring templates, the manufacturer states. The various holders are designed for punches and dies intended to punch various round and shaped holes up to 1¼ in., and 3½ in. in diameter. Three parts must be interchanged — punch tip, stripping plate and die. There are adjustable back and side gages on both holders. Notching operations are performed without any adjustments when the notching unit is placed on the bed table.

Aluminum Roofing Panel Former

ALUMINUM ROOFING applied with a special roll forming machine used on the job — Roliton of America, Inc., 714 E. Van Buren St., Phoenix. A guide rack is set up, running from the machine to the roof, so that the panels of aluminum to be formed may be passed directly up to the roof surface. Two coils of aluminum are fed into the machine. One forms a 16 in.-wide panel, the other, a batten which covers the seams between panels. Serrations or "ribs" formed into the panel are intended to provide strength and rigidity. The panel and batten are continuous strips and are laid from eave to eave. Aluminum clips are fastened to the roof understructure

and then attached to the aluminum panels. The battens are snapped over the flanges and the clips to form a weathertight seal. No fastenings are exposed to the elements. The construction allows for expansion and



contraction, permitting water vapor to escape and preventing understructure damage due to mildew and dry rot, the company states.

Matched Air Conditioners

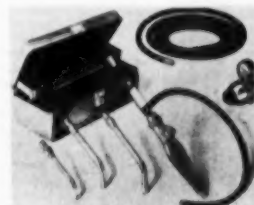
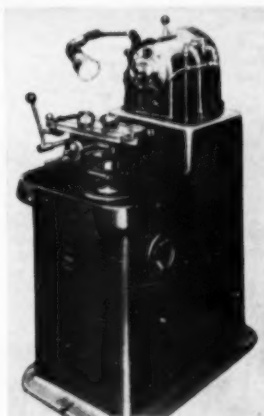
MODEL M air conditioners designed to work with Model 22 and 26 furnaces as well as other sizes — The Majestic Co., Inc., Erie St., Huntington, Ind. The two units (conditioner plus furnace) are designed for counterflow or conventional installations. A 2 ton cooling unit has been designed as a companion piece for the Model 22 furnace and a 3 ton unit for the Model 26 furnace. The



cooling units are also adaptable to existing warm air heating systems. Each cooling unit is provided with its own blower and is independent of the furnace blower. Louvers between the cooling package and furnace compartment are arranged to close off the cooling section during the winter and to reverse the arrangement for summer operation so that the cooling equipment blower can handle the summer load.

Metal-Working Machine

"RINDIS" MACHINE and accessories for performing over 50 different metal-working operations — Newage International, Inc., 235 E. 42nd St., New York 17. The basic unit produces all the movements and the full range of speeds expected from any type of machine tool, the company states. A range of accessories is supplied in the form of complete units. When one of these is fitted to the basic unit, the entire setup becomes a single purpose machine tool. The machine is especially suitable when small runs or individual parts are needed, since they can be turned out without interruption of scheduled production. Two pads are machined at the front of the head for the location of the attachments. Among the operations which the machine can perform are band-sawing, boring, deburring, die grinding, and external grinding.



Above: Repair Kit

Left: Metal-Working Machine

Repair and Leak Detector Outfit

"PREST-O-LITE" OUTFIT for leak detection as well as soldering and brazing of refrigeration and air conditioning systems — Linde Air Products Co., Div. of Union Carbide and Carbon Corp., 30 E. 42nd St., New York 17. The "Halide" leak detector stem locates leaks of such gases as "Freon," Carrene, etc. It shows up as little as 20 parts of refrigerant gas in a million parts of air, the manufacturer states. The outfit includes three torch stems to provide flame for all open-flame soldering, and brazing operations. In addition to a handle, the leak detector stem, and the torch stems, the outfit includes an acetylene regulator designed to maintain selected pressure at the torch, and an acetylene supply hose.

Electric Draft Control

"CAMPBELL" electric draft control suitable for residential and small commercial applications — Fuel Reduction Corp., 220 N. Ada St., Chicago 7. The control consists of two damper openings. A smaller damper operates barometrically when the stoker or burner is firing. When the heating plant shuts off, a larger electrically operated draft gate takes over. The damper automatically moves to a full open position, bypassing about 80 per cent of the chimney pull, the manufacturer states.

(Please turn to page 160)

Old Man Winter is at the door!



take a good look at your heating system... now!

Remember last winter? Well... there's no good reason for you and your family to suffer through another uncomfortable heating season of being too hot, then too cold.

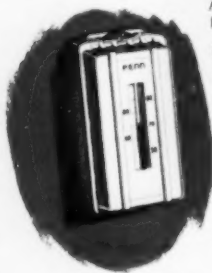
Here's all you do. See your heating dealer now... ask him to show you how a modern automatic heating system controlled by the modern PENN

heat-anticipating room thermostat definitely stops Hot-n-Cold living.

The PENN thermostat is no ordinary thermostat. It not only "feels" the changes in room temperature but senses them in advance. This amazingly accurate thermostat with its PENN-made magic of "heat anticipation" keeps room temperature within 1° regardless of outside weather conditions. And that's real heating comfort for you and your family!

Whether you buy a new heating plant or modernize your old one, insist on PENN Controls... they cost no more but give much more in comfortable living.

Penn Controls, Inc.
Goshen, Indiana.



COMFORT
around
the clock



For greater comfort, convenience and fuel economy, also get the PENN Ten-Clock. It lowers the temperature at bedtime so you can enjoy the restful sleep of a cooler home. Then, in the morning before you arise, Ten-Clock brings temperature back to daytime level. And it's all done automatically!

PENN

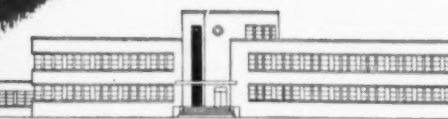
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FOR HEATING, REFRIGERATION, AIR CONDITIONING, PUMPS, AIR COMPRESSORS, ENGINES, GAS APPLIANCES

THIS YEAR... OVER 30,000,000
MESSAGES WILL HELP YOU SELL

Above advertisement will appear in the September issues of Better Homes & Gardens and American Home... and the September 14 and 28 issues of Newsweek. Similar Penn ads will appear in the October and November issues.

PENN



AUTOMATIC CONTROLS

FOR HEATING, REFRIGERATION, AIR CONDITIONING, GAS APPLIANCES, PUMPS, AIR COMPRESSORS, ENGINES

IT STARTS
**buying
action**

WHEN YOU WANT IT!

Now... before the winter rush... is when you want your heating prospects to modernize their heating systems. These Penn Control ads help you get 'em going. They direct your heating prospects to see you now for more comfortable living this winter... they pre-sell your prospects on automatic heating with Penn's heat-anticipating thermostat and Penn heating controls... they make your heating sales job easier.

It's up to you to cash in on these free Penn salesmen! See your heating prospects right away... show them how to end Hot-n-Cold living with the Penn heat-anticipating thermostat... tell them why Penn Controls are best for any heating system.

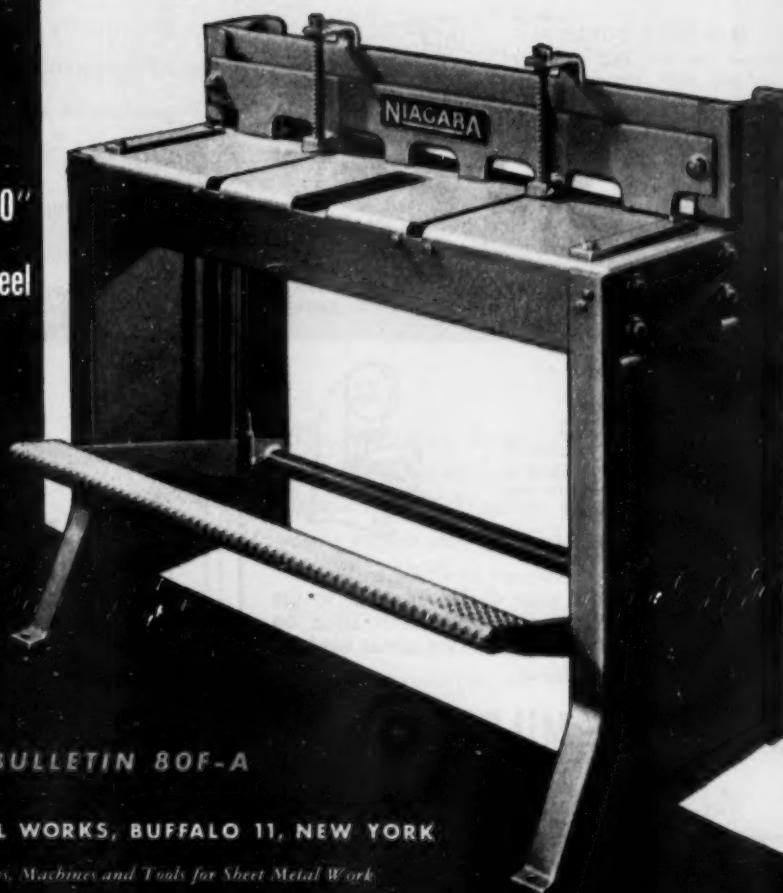
There are big heating profits ahead. Get your share... write for a supply of Penn consumer literature and sales aids. **Penn Controls, Inc., Goshen, Indiana.** Export Division: 13 E. 40th Street, New York 16, N.Y., U.S.A. In Canada: Penn Controls Limited, Toronto, Ontario.



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- ★ Holddown on sizes 36" and larger
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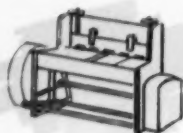
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WYSONG

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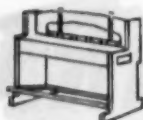


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AIR POWER SQUARING SHEARS

6 models in cutting lengths from 36 inches through 10 feet, with capacities of 18 and 16 gauge.



FOOT POWER SQUARING SHEARS

6 models in cutting lengths from 36 inches through 10 feet, with capacities of 18 and 16 gauge.

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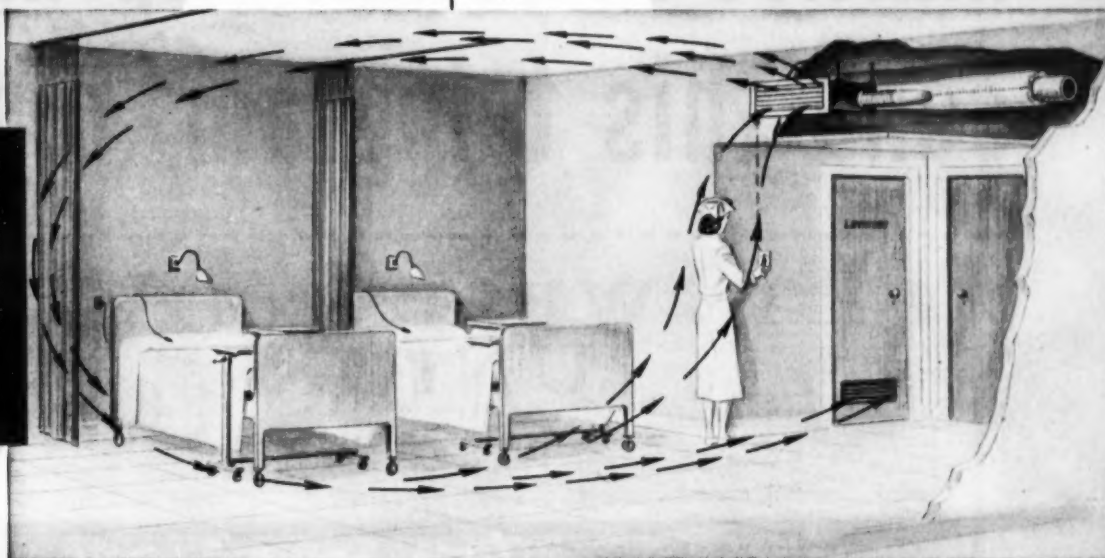
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You will find these units ideally suited not only for hospitals, but also for hotels, offices and similar installations—in new as well as old buildings.

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equipment to hit the
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FIRED EQUIPMENT. I WOULD BE INTERESTED IN HANDLING THE LINE
IN THIS LOCALITY AS A WHOLESALER _____ HEATING CONTRACTOR _____.

(FILL IN YOUR NAME AND ADDRESS)

EVAPORATIVE COOLERS—

(Continued from page 73)

saturation and to prevent the water from trickling out of the cooler (see Fig. 3).

What Type of Fan?

Both propeller fans and centrifugal fans are used in evaporative coolers. Generally, the propeller fan is used in coolers rated at 2000 cfm and less. The centrifugal fan is used in coolers of larger capacity; however, there has been a trend to the use of this type of fan with a direct drive motor in the smaller coolers.

The propeller fan is customarily used for free air delivery or for operation against low resistance. For this reason it is commonly used in the smaller coolers, as these coolers are generally installed in a window and the fan operates against no external resistance other than that imposed by the cooler itself. The centrifugal fan is designed to develop large volumes of air against higher static resistance than the propeller fan requiring the same size discharge opening, and is therefore used in the larger coolers, especially if they are connected to ductwork.

It is often recommended that propeller fans for evaporative coolers be of the three or four blade type, with a blade pitch of between 18 and 23 deg. This type of blade usually is preferred for coolers because it tends to be quieter than other types at the same motor speed. Increasing the blade pitch will increase air delivery, but a pitch beyond 23 deg usually will raise the fan noise beyond a desirable level, particularly for residential installations.

Which Fan Position?

In general, the most satisfactory fan position in relation to the discharge opening, known as the orifice, is that in which one-third of the total fan depth extends through and beyond the front surface of the orifice in the direction of air flow, as shown in Fig. 4.

While this is considered the best all around fan position, the fan may be located somewhat inside of the

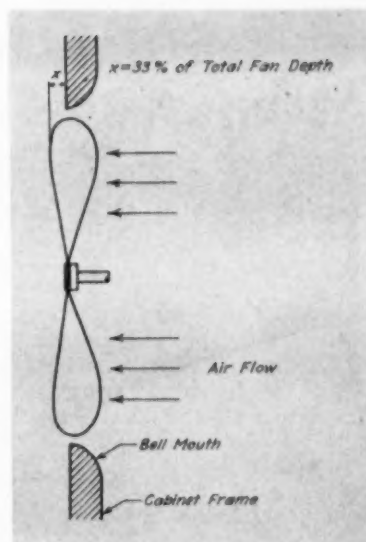
cabinet to muffle the inherent noise. As long as the fan is operating against low external pressure there is no disadvantage to this position. The orifice diameter should be the most practical minimum diameter that can be used if the fan is in the one-third through position. A bell mouth or cone arrangement of the discharge opening will give the best fan performance — as much as 5 to 10 per cent improvement will be gained over a straight edged opening.

What Type of Blower Wheel?

Points to keep in mind about blower wheels used in coolers are the balance, size, durability and noise. Only blower wheels that have been factory balanced should be used because an unbalanced wheel not only will be noisy, but also will cause excessive wear at the shaft bearings. Size of the fan for a given capacity is important, since the blower wheel in an evaporative cooler obeys the same fan laws that apply in any other fan application. Briefly the fan laws tell us that: 1) volume varies directly as the speed; 2) static pressure varies directly as the square of the speed; and 3) hp varies directly as the cube of the speed. Generally, it is better to use a larger wheel turning at a slower speed than a small wheel turning at a high speed.

As an example, let us assume that a particular installation requires 3200 cfm with a duct system resistance of 0.25 in. water gage. This could be handled with a cooler having a wheel as large as 18 in. running at a speed of 302 rpm with an outlet velocity of 1117 fpm and a brake hp of 0.27, or with a cooler having a wheel as small as 12 in. running at a speed of 580 rpm with an outlet velocity of 2222 fpm and a brake hp of 0.585. While this is an extreme illustration it points out that the larger wheel will operate at less than one-half the power consumption of the smaller wheel. Also there will be a lower noise level with the slower fan because of the lower speed.

Although the blower is not exposed to water corrosion, it is sub-



4 IN THIS FAN POSITION, found to be most generally satisfactory, one-third of the total fan depth extends through and beyond the front surface of the orifice in the direction of the air flow

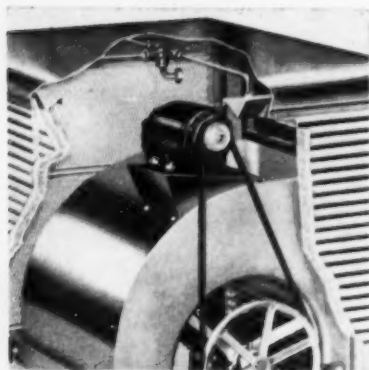
jected to a high humidity atmosphere, and laboratory tests have shown that unprotected or untreated steel may have an average paint life as low as 100 hr when exposed to a temperature of 105 F and 95 per cent relative humidity. For this reason, blower wheels, used in evaporative coolers should be protected from corrosion.

When Use Shaded Pole Motors?

Motors for evaporative coolers range in size from 1/40 to 2 hp. The propeller fan coolers and small direct drive centrifugal fan coolers are powered by what is known as a shaded pole motor.

The two pole shaded pole motor is usually used to drive the water pump for recirculating the water in a cooler. In general, the four pole shaded pole motor is used for propeller fan coolers and it can be furnished in sizes from 1/40 through 1/15 hp for propeller fans 10 through 16 in. in diameter. For small direct drive blower coolers not less than a six pole shaded pole motor is used because the lower speed of the motor (900 rpm) assures reasonably quiet operation.

In all cases, it is desirable to insert



5 AN ORIFICED FITTING may be used to distribute water to individual water troughs for each cooler pad

sound or vibration absorbing material between the motor and the cabinet of the cooler. Motors have an alternating current hum which can be transmitted through the motor mount into the other parts of the cooler which act as sounding boards unless this is done.

What Motors for Blower Wheels?

Split phase motors are generally used on blower coolers where the hp requirements do not exceed 0.65 hp. For cooler applications the split phase motor is furnished with an open type frame which, when horizontally mounted, meets NEMA specifications for drip-proof construction. These motors should also be equipped with a resilient mounting to minimize the transmission of noise to the blower housing.

Customarily the special service type of split phase motor is used in the evaporative cooler industry. Since the cooler application requires relatively infrequent starting, the special service motor has proved quite reliable for this usage.

Although the special service motor is a 50 C rise motor with a service factor of unity, it may be loaded beyond this factor in cooler application because of the additional cooling available to the motor. The cool filtered air drawn in through the cooler pads passes over the motor reducing its normal operating temperature. The amount of permissible overloading varies greatly with the design of the cooler and

how much of the air is actually going over the motor. Tests should be made to determine this allowable overload. It has often been found that up to 35 per cent above the hp rating of the motor may be attained without exceeding the 50 C rise permitted and without excessive dropoff in speed.

The special service split phase motors that are generally used in coolers are 1/4, 1/3, and 1/2 hp, 1725 rpm sizes used to drive blower wheels ranging from 10 in. through 22 in. in diameter. The 1/3 hp motor is available with a dual winding for two speed cooler operation and is becoming a very popular model.

In addition to the shaded pole and special service split motors, there is the capacitor-start motor for evaporative coolers requiring a motor larger than 1/2 hp. An open frame which meets the NEMA classification of drip-proof when mounted in the horizontal position is used to take advantage of the additional cooling available to the motor. In the 1/2 and 3/4 hp sizes special service capacitor start motors with an allowable 50 C rise in temperature and a service factor of unity usually are used.

Permissible loading runs approximately 15 per cent in excess of the service factor. One hp and larger motors are the general purpose type with a 40 C temperature rise and a service factor of 1.25.

Water Distribution

Important in the successful operation of an evaporative cooler is the method employed to get water to the pad and to keep the pad uniformly wet.

An improved method of distribution is that shown in Fig. 5. Water is metered and distributed, by means of an orificed fitting, to an individual water trough for each cooler pad. Each trough should be designed to provide an even flow of water along its entire length and be non-clogging. If the trough is over 2 ft long, it is advisable that it be supplied by two distribution tubes.

Other Design Considerations

Other details of cooler design that should be considered are the drive pulley on the motor, the blower housing mounting and general appearance.

It is desirable that a variable pitch drive pulley be furnished. Such a pulley will permit speed variations of approximately 30 per cent and will thereby compensate for variations in the calculated air volume and duct resistance. The adjustable pulley is usually made of cast iron, although steel pulleys have been used to some extent.

The blower housing should be completely isolated from the cooler cabinet. This may be done through rubber mountings and a flexible connection between the front panel of the cooler and the discharge opening of the blower housing or scroll. Avoidance of metal to metal contact between the blower housing and the cooler cabinet minimizes the possibility of noise and the transmission of vibration from the rotating parts of the cooler to the stationary parts.

Another feature that should be considered in the design and selection of an evaporative cooler is its exterior finish, which should be both attractive and durable. One finish that is currently popular with producers is a hard baked-on enamel with a good gloss.

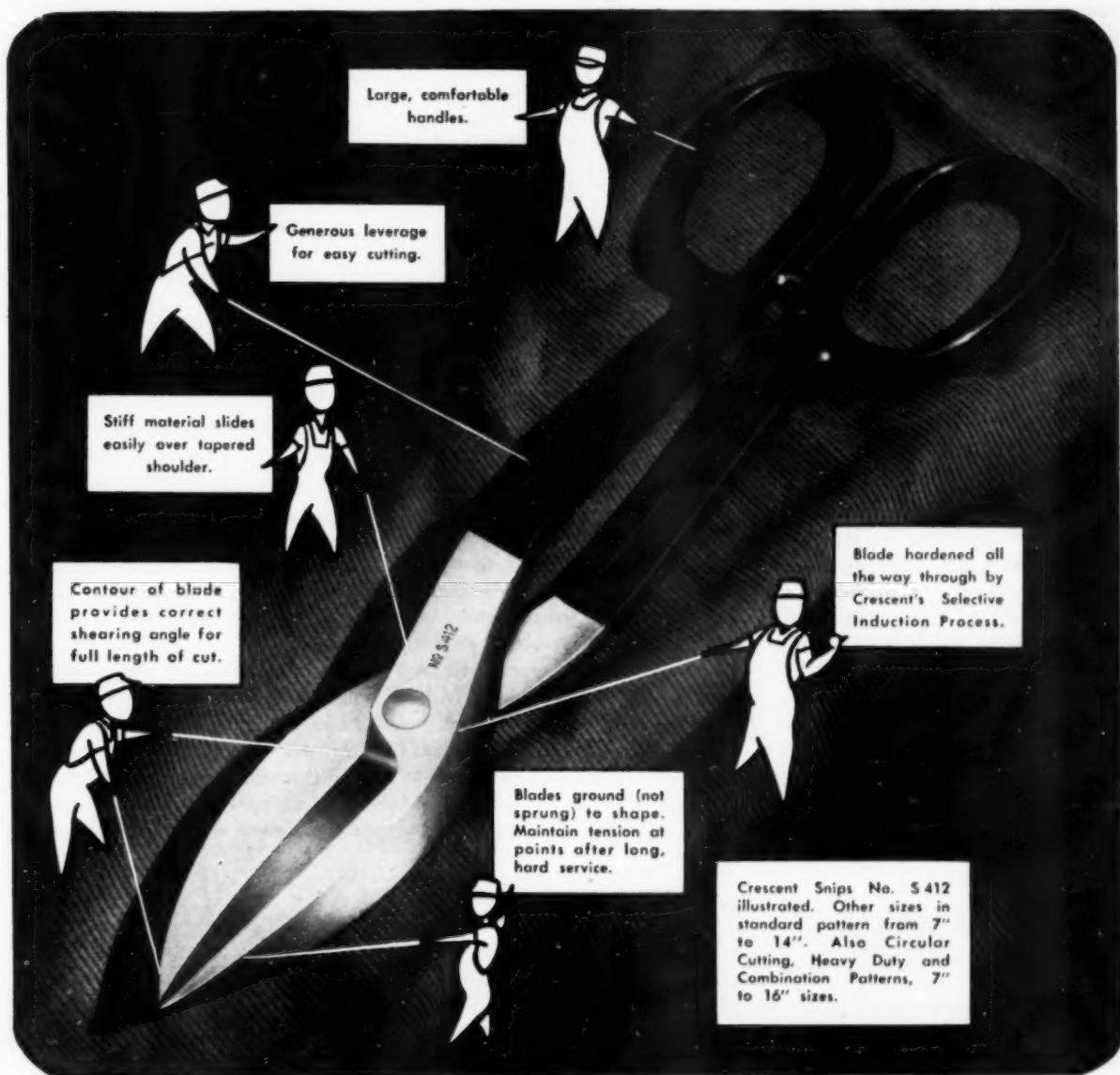
If the cabinet is fabricated of galvanized steel an organic finish paint should be used, preferably preceded by a suitable primer to improve the adhesion and moisture resistance of the finish.

[Figs. 1, 3, and 5 courtesy International Metal Products Co. Figs. 2 and 4, courtesy Torrington Mfg. Co.]

PRODUCING WAVE GUIDES

A NEW technique for producing lightweight wave guides involves silverplating stainless steel strip, roll-forming it into U sections, then resistance-welding two sections, mouths facing, to form the duct. Government report PB 107412, describing the method, is available from the Library of Congress, Photoduplication Section, Washington 25. (Microfilm, \$2.50; photostat, \$6.25).

Why Craftsmen prefer CRESCENT SNIPS



● All Crescent Snips are forged of selected steel and blades ground on special grinding machines. They are hardened by Crescent's own selective induction process to insure long satisfactory service. These easy-cutting, well-balanced snips are made in four patterns; standard, circular cutting, combination and heavy duty. Sold by hardware dealers everywhere.



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CRESCENT TOOL COMPANY, JAMESTOWN, NEW YORK

PERIMETER LOOP —

(Continued from page 67)

heat input to the Residence was admitted through the heating system proper. This value indicated that 23 per cent or about one-fourth of the heat supplied to offset the heat loss of the Residence was from sources other than the heating system with the registers and the embedded ducts.

Burner, Furnace Performance

No difference in fuel costs could be detected between any of the feeder duct arrangements for the perimeter-loop system or the two-loop system.

A comparison of the actual fuel consumption with the theoretical requirements revealed that a difference of approximately 5000 Btu per hr occurred. This difference was attributed to the vagrant heat gains from the furnace casing and flue pipe, and the direct heat gains from lights, etc. This 5000 Btu per hr represented a margin of safety of about 8 per cent of the theoretical input of 65,000 Btu per hr. Hence, the practice of selecting the fuel input rate for this type of structure (where perimeter ducts are used) on the basis of the total calculated heat loss divided by the assumed bonnet efficiency appears to be reasonable.

In connection with the blower performance, measurements were made of the pressure losses for the duct system for Series P-11. The pressure loss for the entire duct system was only of the order of 0.10 in. of water. Since the blower-furnace unit was rated to discharge air against an external static pressure of 0.20 in., it was apparent that the warm air ducts could have been reduced in size.

Summary and Conclusions

Although we have not discussed all the factors which are of importance in evaluating the performance of any heating system, the most important ones have been mentioned. In regard to these factors, the following conclusions were drawn:

1 The response of the perimeter-loop system to sudden changes in outdoor temperature was satisfactory. The conventional room thermostat proved to be satisfactory for controlling the room-air temperatures.

2 Room-air temperature differentials were low for the perimeter-loop system. In general, the more feeders used the lower the differentials because of the greater panel heating effect and a resulting lower convection heating effect.

3 The practice of balancing the

system by means of adjusting the shutter dampers on the floor registers proved to be satisfactory. In contrast to the experience with the two-loop perimeter system, no difficulty was encountered in balancing the perimeter-loop system.

4 The pressure loss external to the furnace-blower combination was less than the 0.20 in. of water available. This indicated that some reduction in the size of both the feeder and the perimeter ducts could be made without exceeding the available pressure of the blower.

5 Floor-surface temperatures were satisfactory for the duct arrangements in which feeder ducts extended into the exposed corners of the floor. In cases where feeders were not extended into the corner areas, the floor-surface temperatures tended to be low.

6 On the basis of the results obtained with the four separate arrangements for the perimeter-loop system it was evident that such a system should be designed so that feeder ducts extend into exposed corners of the floor, that the total air-flow distances from the subfloor plenum to registers should be relatively short, and that relatively high air-flow rates can be maintained in all sections of the perimeter duct.

INVALID CONTRACTS —

(Continued from page 98)

"Instead of accepting the counter proposal and signing the proffered subcontract, the subcontractor wrote in effect that he was unable to accept the counter proposal and withdrew his bid. There was never a meeting of the minds."

This failure of a party to a contract to cover completely the offer in its acceptance often occurs but is inevitably fatal to the creation of a valid and enforceable contract.

"It is elementary law," said this court in an earlier decision involving this same principle of law, "that there must be a concurrence of intention to constitute a contract — the minds of the parties must meet and concur as to all the essential elements the contract involves, as to the subject matter and as to the respective rights and duties."

All Terms Must Be Accepted

The law requires that the acceptance relate speci-

cally not only to the same subject matter, but to the terms and conditions of the contract as well.

In a southern state, a purchaser of farm equipment had ordered machinery and stipulated that it be delivered to him at a certain town in that state. The machinery however, was delivered at another place. Claiming that any delivery was an acceptance of his order, the buyer sued for damages for non-delivery (since the delivery had not been to him). In holding that there had been no acceptance of this order by the seller and hence, no contract, the court said:

"The difficulty with the buyer's position is that acts relied on as constituting a contract acceptance, as well as the words, must show an unequivocal, unconditional acceptance of the very terms of the offer."

It can be seen that a proposal to accept, or an acceptance, upon terms varying from those offered, is a rejection of the offer and puts an end to the negotiation unless the party who made the original offer renews it or assents to the modification suggested.

[Note: While this discussion applies to actual cases, it should be remembered that legal rules vary in different states.]

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AND

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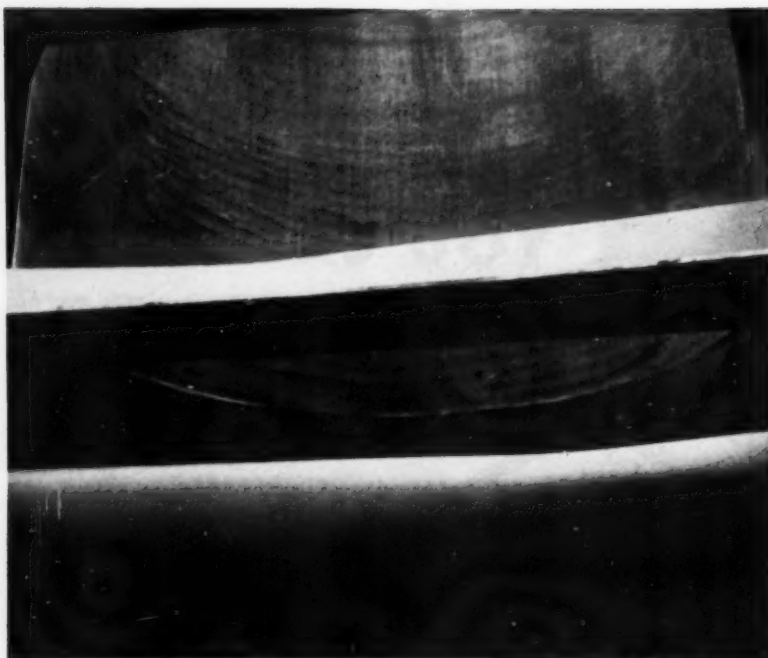


FIG. 4 — A FLAME-SPRAYED POLYETHYLENE COATING is used on the interior of this ventilation exhaust stack. The picture was taken from the breeching through the turning vanes

VENTILATION SYSTEMS —

(Continued from page 71)

require shop drawings on all fabricated material. This requirement is a real safeguard for both the contractor and the engineer since it is the means by which misunderstandings or misinterpretations may be settled in advance, before large financial commitments have been made in actual fabrications.

Special requirements for interior finish and the use of unusual materials and fabrication methods raise questions of acceptability of detail construction features which will be shown on properly prepared shop drawings. Insistence on the submission of complete, detailed shop drawings, and their thorough review and approval before fabrication starts, is the best insurance available against claims for extras, controversy between the builder and the engineer, and delays in completion of the job.

Exhaust Systems

Usually Corrosion Resistant

The supply side of a ventilation system for a building in which radiological hazards exist is usually constructed of conventional materials — galvanized sheet steel or aluminum. The use of these materials involves

conventional problems of fabrication. The exhaust side of such a system requires special treatment to satisfy certain unusual requirements.

In general, exhaust systems must be corrosion resistant to the reagents which may be used in process or experimental work. They must be capable of being decontaminated; that is, they must be constructed of material which will resist decontaminating or cleaning solutions such as 10 to 20 percent nitric acid, detergents, etc. To make thorough cleaning possible, they must have a relatively smooth interior surface finish free from cracks, crevices, or inaccessible pockets. In addition, they often must be arranged to drain completely so that condensate or decontaminating solutions may be readily removed. Of course, the usual requirements for fire resistance and structural stability also must be met.

Welded Stainless Steel Meets Requirements

Stainless steel, fabricated by welding, has been found to meet the requirements for exhaust ductwork. Although its cost and scarcity impose serious handicaps on its use, no substitute has been discovered to com-

pletely supplant this material.

Conventional construction methods have, for many reasons, not been used to a large extent in stainless steel construction. They do not have the required corrosion resistance, or they create inaccessible crevices in which radioactive materials might lodge and from which they would be impossible of removal.

Welding stainless steel in the sheet metal gages can be accomplished only with the inert gas shielded tungsten arc process to yield the required quality of finish and corrosion resistance in the welded joint. This process has undergone remarkable development during the past few years in regard to application techniques.

Suggestions for Welding Stainless Steel Ducts

Fig. 2 shows samples of this type of work. The success of the process was achieved after long — and often painful — experience. Among the more important requirements are skillful operators thoroughly trained in the type of work being done; careful fit-up of parts; back purging (blanketing the back side of the piece being welded with inert gas) or backing the welded piece with a copper chill piece to prevent oxidation of the reverse side of the weld; and careful, thorough removal of all extraneous material from the joint prior to the start of welding.

A large number of other factors — such as welding speed, application of filler metal, type of electrode, rate of gas flow, current, etc. — are links in the chain of variables which determine uniform, acceptable results. A shop would be ill-advised to undertake this work without qualified operators, good equipment and experienced technical personnel to set up an adequate system of process control. In addition, there must be a willingness to make a substantial investment in time and money during the initial periods of production while techniques and procedures are being established.

Welding ordinary 18-8 stainless steel is affected by the phenomenon of carbide precipitation in the weld area. A very serious loss of corrosion resistance results unless measures are taken to counteract this effect. Solution heat treatment (heating to about 2000 F and quenching



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Duct opening	Overall of Louvre Box	Overall of Face	Open Area	Depth of Box
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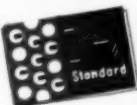
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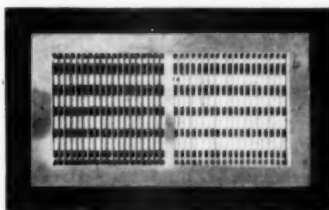
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the entire weldment) will re-dissolve the carbon and eliminate the difficulty. But it is normally impractical to subject ductwork components to this treatment because of the cost, the unwieldiness of the pieces involved and the severe distortion which results in attempting to so treat weldments of light section.

The practical solution to this problem has been to use stabilized stainless steel, AISI type 347, or extra low carbon type 304L, with carbon held to 0.03 percent maximum. The former type has columbium as an addition in the proportion of about eight to ten times the carbon; this effectively eliminates carbide precipitation. The latter has carbon so limited in amount that its precipitation is not a problem. Due to the current scarcity of columbium, very little type 347 is available, except for welding rod; consequently, the 304L type constitutes the bulk of material now in use for this purpose.

The deleterious effect of carbon, in even very small quantities, creates a considerable problem in fabrication. Wire brushes, grinders and tools which might carry particles of carbon or carbon steel cannot be used in the preparation of joints for welding without subsequent operations to remove the carbon. Further, the welding of carbon steel components to stainless steel equipment, even on the opposite side of the material from that which is to be in contact with corrosive media, cannot be permitted due to the uncanny ability of damaging amounts of carbon to migrate through considerable thicknesses of the molten or heated material to the critical surface. This is true even with the use of stainless welding rod.

Aluminum Ducts Reveal Durability

Observation of a number of installations of aluminum ducts which have been exposed to a variety of ordinarily corrosive chemical vapors has revealed unexpected durability in this material. At the present time, one fairly large system is being installed in which all process exhaust ducts downstream of the radiological control filters are being constructed of aluminum with the inert gas shielded tungsten or metallic arc process of welding. Fig. 3 shows the exhaust stack of all-welded alu-

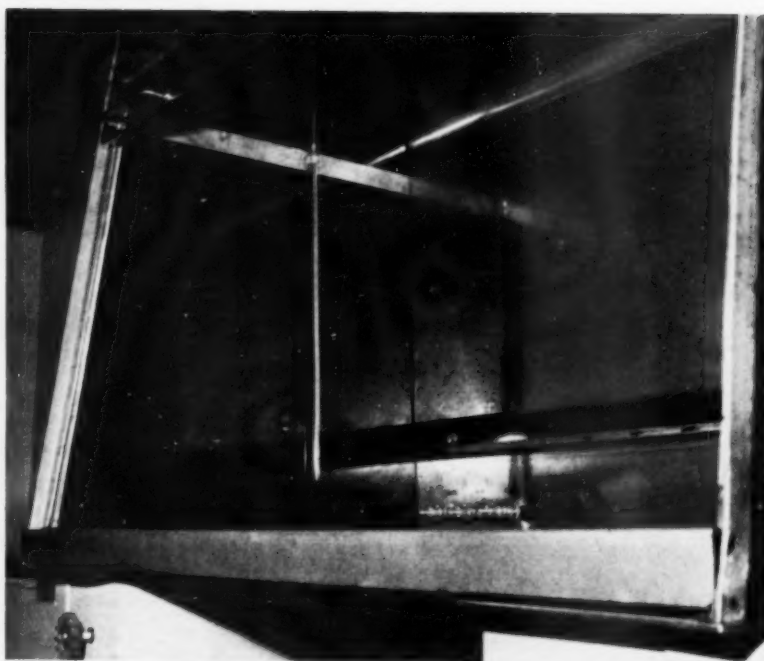


FIG. 5 — PRESSURE AND VELOCITY SENSING POINTS must be installed with care. This hood is equipped with automatic face velocity control. The interior pressure sensing tube is mounted on the side panel

minum construction serving this facility. Stainless steel is used in all exhaust ducts between the sources of contamination and the radiological filters to withstand the effects of decontamination solutions.

Successful operation of this system may lead the way toward the elimination of a great deal of additional expense which is involved in the construction of the entire exhaust system of stainless steel.

Special Coatings Can Lead to Savings

The high cost of construction of stainless steel ducts has led to the use, in some applications, of a number of rather specialized coatings applied to carbon steel as a liner. In general, these coatings themselves are expensive and must be carefully applied; but on large ducts, plenums, etc., substantial savings can be realized by their use.

Special plastic paints have been used extensively and with notable success. These coatings require absolute cleanliness of the surfaces to which they are applied. This means, as a practical matter, that the steel must be either pickled or sandblasted just before the application of the first prime coat. From five to seven coats,

preferably applied in alternate shades to insure complete coverage of each coat, are required. They may be applied by brush or spray and require somewhat special techniques to obtain satisfactory finish. With these coatings, the manufacturers' instructions must be carefully observed and some special instruction in their application is recommended.

Plastic and rubber coatings in sheet form are occasionally applied to the interior of ventilation components. This is strictly a job for experts and should be attempted only by those experienced in this work. Flame-sprayed polyethylene is another plastic coating which is suitable for severe service. The application of this finish is also a specialized process involving careful preparation of the surface before coating, and carefully controlled application techniques. Fig. 4 is a photo taken from the breaching of a flame-spray polyethylene-coated stack through the turning vanes. The smooth but slightly wavy surface of the lining may be observed on the far surface of the stack.

Gaskets and Sleeves for Exhaust Ducts

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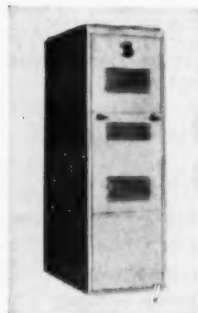
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up of a series of sections welded together or of individual welded sections provided with flanged or sleeve joints so that they can be dismantled. Flanges are commonly formed in one of two ways. One method is to use a flange of $\frac{1}{8}$ to $\frac{1}{4}$ in. thick stainless steel plate welded to the duct; the other and less expensive method is to flare out the duct material in the form of a flange and to provide back-up flanges of heavier carbon steel material. In either design neoprene gasketing has proved highly satisfactory. Polyethylene and other elastic, corrosion resistant plastic materials have also been used with success.

Sleeve joints are sometimes used in place of flanges. This type of joint is limited to round duct and is similar to the radiator hose used on your automobile. It is normally made of neoprene with vulcanized fabric reinforcement or is made of fabric reinforced rubber with a neoprene lining. These sleeve or hose connections are either cemented or clamped to the ducts with large size hose-type clamps.

Interior Finish for "Hot" Ductwork

It is frequently specified that the interior finish for "hot" ductwork (that portion of the exhaust ductwork which extends from the source of airborne radiological contamination to the high efficiency filter) be the equivalent of 2B mill finish. This finish normally falls in the range of roughness of from 10 to 20 micro-inches RMS [root mean square]. In some instances, the entire interior finish (including welds) has been required to meet this standard.

The cost of meeting this type of a specification is not small; consequently, less stringent requirements are adopted wherever possible. For "hot" ducts, about the minimum requirement which can be accepted is a finish which is smooth enough to be thoroughly cleaned by flushing or wiping. Waviness is not objectionable provided there are no sharp indentations or cracks from which minute particles or solutions could not be readily removed.

With welded construction, the very best techniques are required to give an acceptable interior finish without grinding or polishing. Complete and continuous penetration is required

wherever welds are made from the outside. Abrupt convexity of the bead, excessive roughness, undercutting, craters or any other fault on the inside which would render the weld or the surrounding metal difficult to clean must be re-worked or otherwise finished to remove the defect.

It is often correctly pointed out that it is impossible to make a flanged or sleeve joint so perfect as to eliminate retention pockets. Excessive build-up of contamination in these joints can be removed, however, by disassembling and cleaning the metal surfaces and replacing the gaskets or sleeves.

Install Pressure, Velocity Sensing Points With Care

In addition to the usual temperature controls, a rather complicated system of pressure and volume controls may be employed in this work. The proper functioning of controls is dependent on the location of pressure sensing and velocity sensing devices. The control manufacturer should be brought into the picture early, before the ductwork layout is completed, and satisfactory arrangements should be made to meet the requirements of the control system in regard to the location of sensing points.

The points at which pressures may be sensed most accurately are not always predictable. Fig. 5 shows a pressure sensing tube installed in a hood for face velocity control. Pressure must be sensed in this instance to an accuracy of better than plus or minus 0.001 in. WG. The original location of the sensing tube near the top of the hood was found to yield inconsistent results. The location shown was the one finally adopted after considerable experimentation, and gives excellent results.

Static pressure sensing points in ducts or plenums must be arranged to compensate for velocity effects. Where flush sensing points are in-

stalled, care must be taken that the inner surface of the duct is smooth and that the sensing hole is absolutely flush, smooth and without burrs. Preferably, such points should be located in a straight section of duct with the air flow as undisturbed as possible by bends or branches upstream of the sensing point. Similar precautions in regard to location should be taken in the case of velocity sensing points.

Careful Inspection and Testing Needed

Inspection to assure acceptable quality of workmanship and materials will require more than normal effort — especially for the exhaust system. Proof of compliance with specifications should be required for all material finished in the case of stainless steel. Mill heat numbers, as marked on the material being fabricated, and certified chemical analyses of heats are normally sufficient evidence. Shop inspection by qualified welding inspectors is required to determine that the material is not damaged in process by poor techniques. A good deal of judgment is necessary in passing on the acceptability of interior finish, since it is difficult to describe this requirement in words.

Pressure tests are not normally specified for exhaust systems — even the "hot" ones. A very careful visual examination, along with smoke gun tests at the joints while the system is in operation, will usually suffice. Normal inspection for compliance with drawings and specifications applies, but special emphasis should be given to the construction details previously discussed to make sure that nothing in the construction of the system will contribute to pulsations or irregularity of air flow, which would cause difficulty later in balancing and in obtaining proper control.

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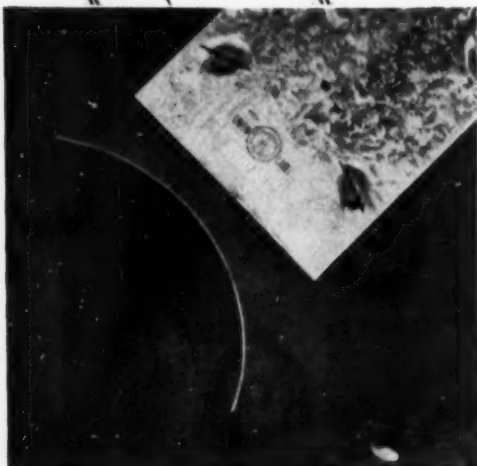
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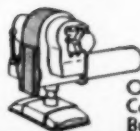
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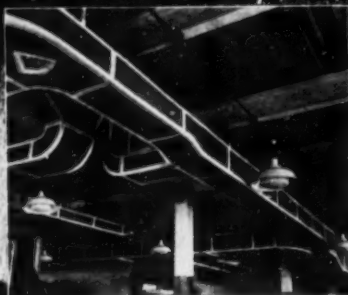
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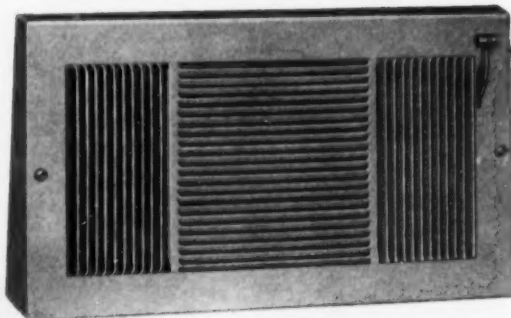
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You want your jobs to look their very best — certainly — but you also want them to *work* their very best and to *stand up* their very best through the years to come. ROCK ISLAND registers will help you in all 3 ways.

Our No. 92S Out-o-Wall Diffuser

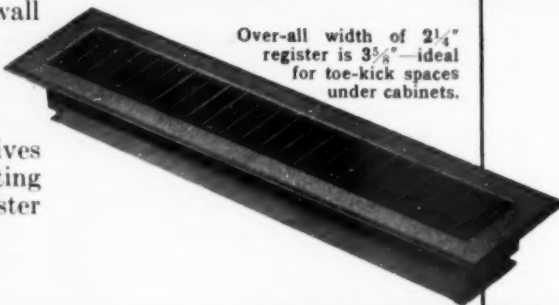


(above) has the correct design and the quality of workmanship to lead the industry in performance. The un-retouched photograph at the right demonstrates its diffusion capabilities and shows how it spreads the warm air rapidly . . . thanks to its 3-way grille.

It extends only one inch beyond the base-board and quarter-round and does a perfect job on perimeter installations. Shipped in either Metal-Lustre or Prime-Coated finish. The latter is suitable for installation as is or for finishing to blend with woodwork or wall tones.

Our No. 45 Perimeter Diffuser

with varied angle vanes and two louvres gives excellent air-control and has stop-setting damper adjustments. Comes in Metal-Luster or Oak-grain finish.



Over-all width of 2 1/4"
register is 3 3/4"—ideal
for toe-kick spaces
under cabinets.

ROCK ISLAND REGISTER COMPANY

2435 FIFTH AVE. • ROCK ISLAND, ILL.

**Send For Our
Net Price Book**

This compact guide to the prices of things you need is a valuable help in estimating new jobs. Yours on request.



in 25 years....

2,228,460,000,000
cubic feet of air delivered!

*without major mechanical
difficulty of any kind*

**EVERY CLARAGE FAN
EVERY CLARAGE WASHER
STILL ON THE JOB!**

In June 1928, Fidelity-Philadelphia Trust Company, placed in operation its Clarage equipment —40 fans and 4 air washers.

Today the same 40 Clarage fans and the same 4 Clarage washers provide efficient, dependable ventilation for this great office building —and they are apparently good for another quarter-century of service.

In handling over two and one quarter trillion cubic feet of air, not a single replacement has been made, nor a single major mechanical difficulty encountered.

Thanks to adequate maintenance on the part of Fidelity management, this Clarage equipment has had the opportunity to prove our slogan: "You can RELY on Clarage"—RELY on Clarage to cost you far less in the long run.

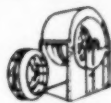
Write us about your air handling and/or air conditioning needs...CLARAGE FAN COMPANY, Kalamazoo, Michigan.

**1928-1953
25th
Anniversary**
FIDELITY-PHILADELPHIA TRUST
PHILADELPHIA, PA.

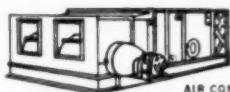
CENTRAL
AIR CONDITIONING



INDUSTRIAL
HEATING



VENTILATION



UNIT
AIR CONDITIONING



AIR CLEANING

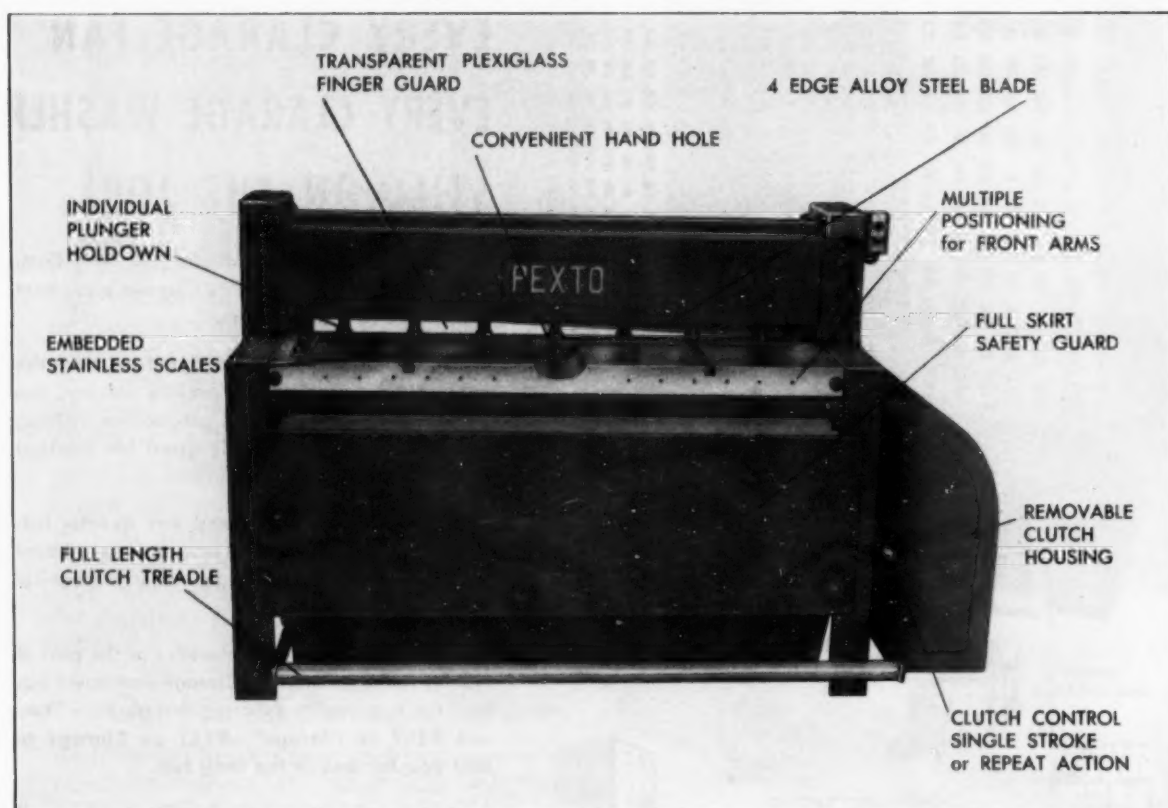
**You can Rely on...
CLARAGE**

**Headquarters for
Air Handling and
Conditioning Equipment**



SALES ENGINEERING OFFICES IN ALL PRINCIPAL CITIES • IN CANADA: Canada Fans, Ltd., 4285 Richelieu St., Montreal

2 OUTSTANDING PEXTO PRECISION POWER SQUARING SHEARS



9PX53A

- No. 12-U-4, 12-Gauge Underdriven 4-ft. capacity
- No. 14-U-6, 14-Gauge Underdriven 6-ft. capacity

For further information, write to:

THE PECK, STOW & WILCOX CO.

SOUTHINGTON, CONNECTICUT, U. S. A.

SINCE 1785



Here's the best way to get into the Air Conditioning Business

Sell the Carrier Weathermaker Air Conditioner!

You'll be sure of a big volume of profitable sales because the Weathermaker is designed right, mass produced, and priced to sell. Right now it's the biggest selling single-package home air conditioner in the country.

Sell the Carrier Weathermaker Air Conditioner!

It's simple to install and a cinch to service if need be. Thousands have already been installed and they've proven themselves to be trouble-free in performance!

Sell the Carrier Weathermaker Air Conditioner!

You'll share all the advantages of Carrier's years of experience in heating and cooling. You'll benefit from the prestige that comes from being affiliated with America's largest air conditioning manufacturer!

Sell the Carrier Weathermaker Air Conditioner!

The coupon starts you on your way!

CARRIER CORPORATION

308 S. Geddes Street, Syracuse, New York

I'd like to get into the air conditioning business in the best way. Tell me how. Send me the name of my nearest Carrier Distributor.

Name

Street

City State



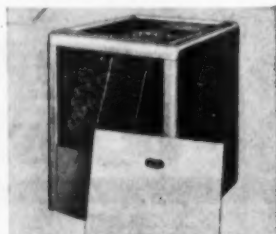
air conditioning refrigeration industrial heating

*Products
of
Character*

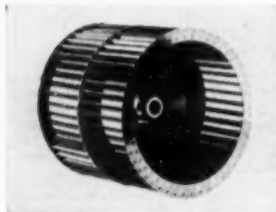
YOU CAN SELL
WITH CONFIDENCE



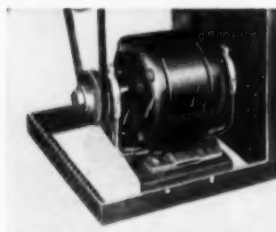
Blower assembly insures proper air circulation, even where the heat runs are long.



Easy access to filters and blower through removable rear panel of the smoothly styled cabinet.



Smooth, vibrationless wheel, statically and dynamically balanced.



Nationally advertised electric motor has overload protection and resilient mounting.

Brundage

BLOWER-FILTER PACKAGE UNITS

open doors to additional profitable business for you

Are you overlooking some profitable business that could come in mighty handy, particularly in the off-season? Business that may be going to others?

Statistics show that in the average community twenty percent of the new warm air furnace installations are gravity furnaces. Add these to the older gravity furnaces already in use and it all adds up to a sizeable sales potential for conversion blowers . . . right in your own front yard!

And, the blower you can recommend with confidence and sell with profit is the Brundage Blower-Filter Package Unit . . . it's engineered and styled in a wide range of sizes for every type of warm air heating plant. It's quiet running, economical to operate, saves fuel. And, it's easy to install without inconvenience to the home owner, even in coldest weather. What's more, Brundage efficiency and dependability insure against profit-eating service call-backs.

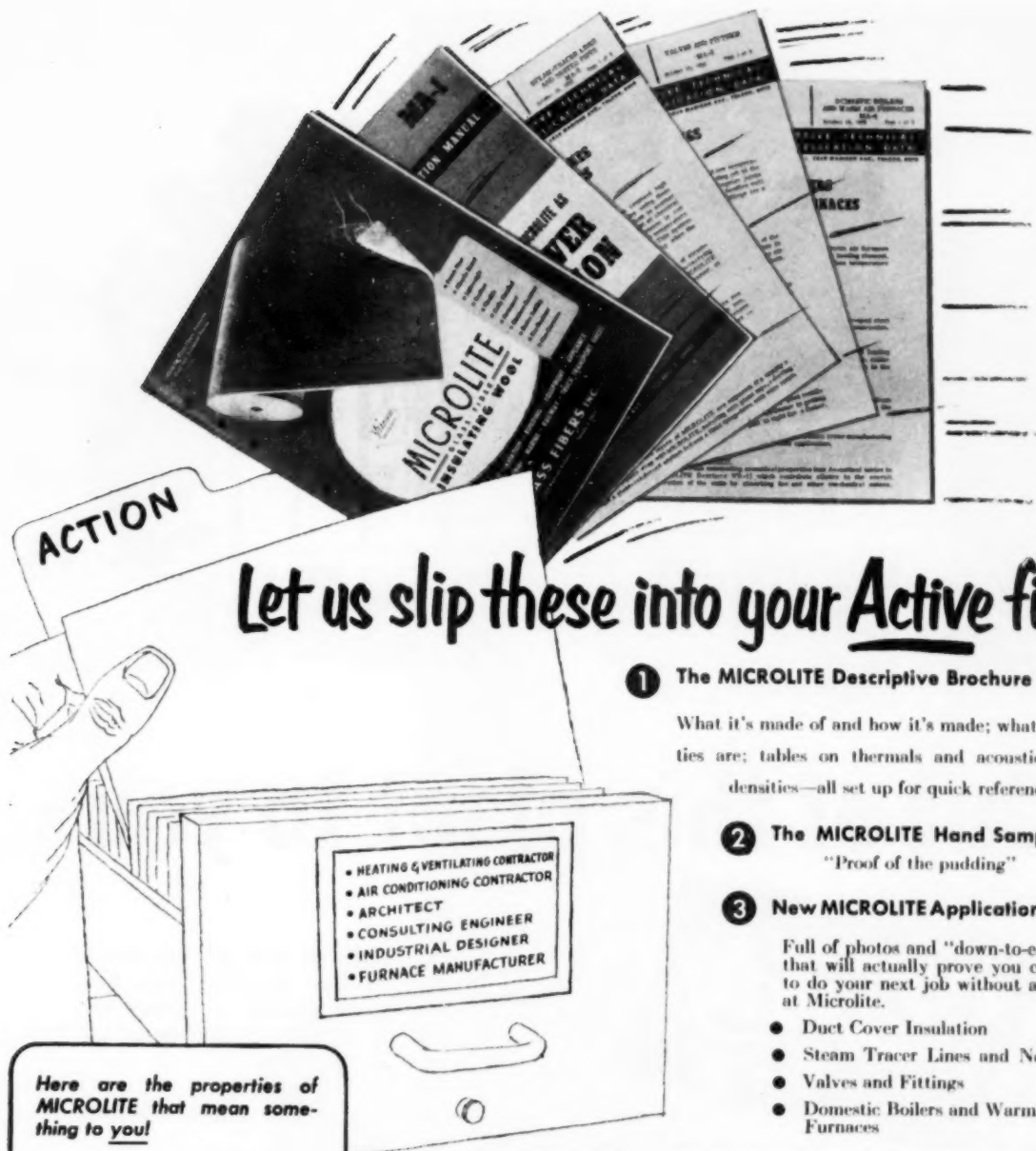
Take the first step *now* toward securing your share of this profitable conversion blower market. Send today for full details on Brundage Blower-Filter Package Units, "Products of Character."

THE *Brundage* COMPANY

Blower Specialists Since 1919

516 NORTH PARK STREET • KALAMAZOO 11, MICHIGAN

Northwest Representative: Harold Winningham & Co., 1117 Second Ave., Seattle 1, Wash.



Let us slip these into your Active file

Here are the properties of **MICROLITE** that mean something to you!

- **LIGHT AS A FEATHER**
means large pieces can be handled easily
- **NON-ITCHING SOFT**
means no more work gloves
- **HIGH TENSILE TOUGH**
means you can pull it snug around ducts and pipes, tie it up and staple it easy



1 The MICROLITE Descriptive Brochure

What it's made of and how it's made; what its properties are; tables on thermals and acousticals; sizes; densities—all set up for quick reference.

2 The MICROLITE Hand Sample "Proof of the pudding"

3 New MICROLITE Application Manuals

Full of photos and "down-to-earth" facts that will actually prove you can't afford to do your next job without a close look at Microlite.

- Duct Cover Insulation
- Steam Tracer Lines and Nested Pipes
- Valves and Fittings
- Domestic Boilers and Warm Air Furnaces

GLASS FIBERS INC., 1810 Madison Avenue—Toledo 2, Ohio

Yes, I'm interested in what Microlite can do for me. Please send the following pieces of literature by return mail:

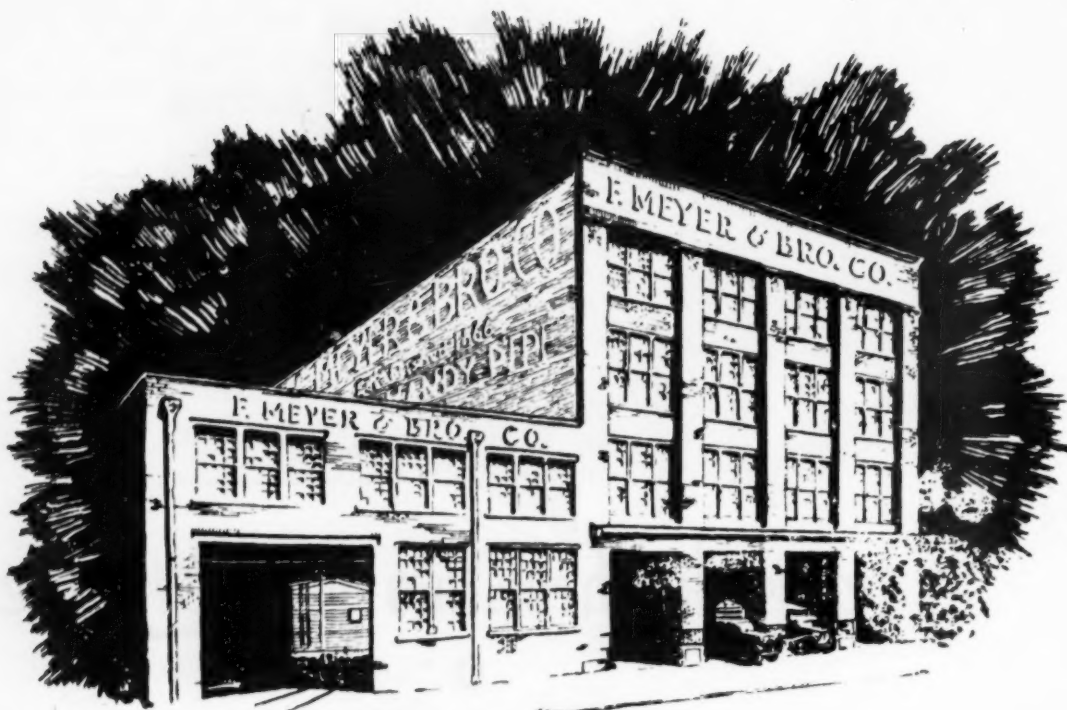
- | | |
|--|---|
| <input type="checkbox"/> MICROLITE DESCRIPTIVE BROCHURE | <input type="checkbox"/> MICROLITE Application Manual: VALVES and FITTINGS |
| <input type="checkbox"/> MICROLITE Application Manual: HEATING and AIR CONDITIONING DUCTS | <input type="checkbox"/> MICROLITE Application Manual: DOMESTIC BOILERS and WARM AIR FURNACES |
| <input type="checkbox"/> MICROLITE Application Manual: STEAM TRACER LINES and NESTED PIPES | <input type="checkbox"/> YES. Send me a sample of MICROLITE |

NAME _____ TITLE _____

COMPANY _____

STREET ADDRESS _____

CITY _____ ZONE _____ STATE _____



Out of this plant to you

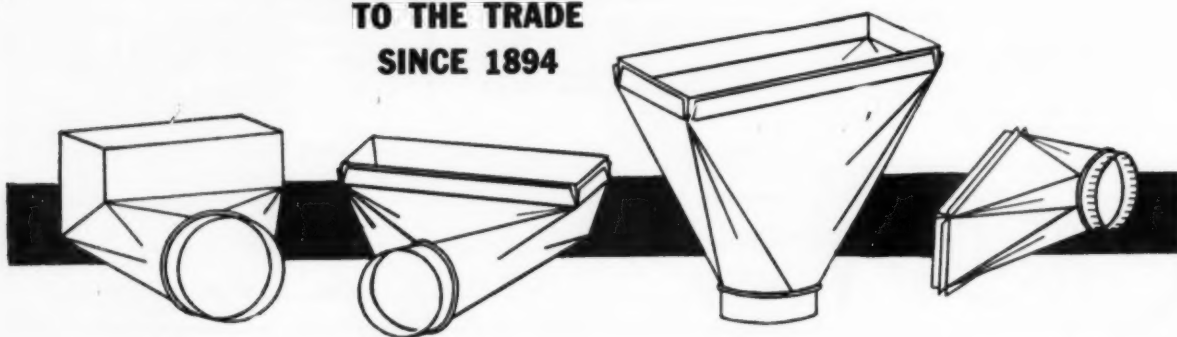


**THE HANDY PIPE FLAG
HAS REPRESENTED
FURNACE PIPE QUALITY
TO THE TRADE
SINCE 1894**

are ready to flow all the kinds and types of **HANDY** pipe and fittings for gravity or forced air installations on conventional or outside wall jobs.

Let us help you make this fall your biggest yet.

F. MEYER & BRO. Co.
PEORIA, ILLINOIS



**These
Bright
Spangles
Attract
Customers**



The thousands of gleaming zinc spangles on a Bethlehem galvanized steel sheet are a powerful sales feature. The light they reflect gives this sheet a bright, clean appearance that attracts the eye.

But good appearance is only part of the story. This coating is not only attractive—it is tight, uniform, and ductile. It provides excellent protection against corrosion. And it holds securely, even after the sheet is formed or bent.

Bethlehem galvanized sheets are made from strong, durable steel, either plain or copper-bearing. They are easy to work with, and they go a long way toward helping you turn out neat, professional-looking jobs.

BETHLEHEM STEEL COMPANY, BETHLEHEM, PA.

On the Pacific Coast Bethlehem products are sold by Bethlehem Pacific Coast Steel Corporation
Export Distributor: Bethlehem Steel Export Corporation

**Bethlehem
GALVANIZED
Steel Sheets**



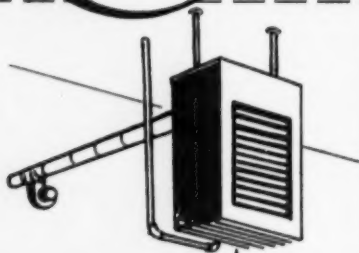
8

new sources of profit for YOU!

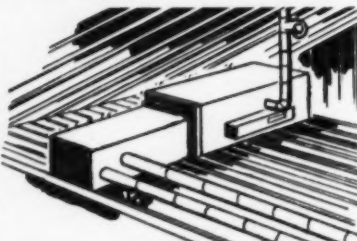
CORRECTING COMMON HEATING
PLANT DRAFT TROUBLES



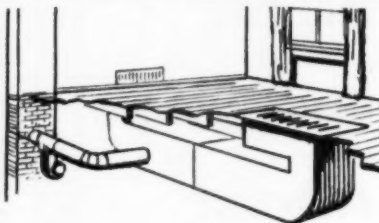
IN RANCH-TYPE HOMES where chimneys are too low to provide enough draft, **quickdraft** assures efficient, trouble-free heating plant performance . . . prevents pulsating, chattering.



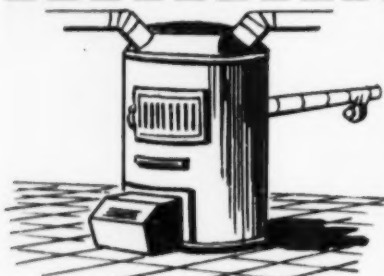
ON SUSPENDED UNIT HEATERS **quickdraft** provides draft needed to carry off all combustion by-products . . . prevents condensation damage . . . keeps chimney dry . . . can be vented outside without chimney.



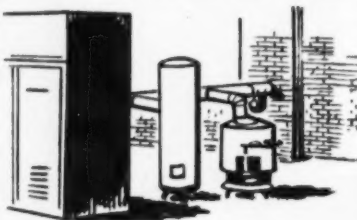
ON ATTIC FURNACES **quickdraft** provides the proper draft that short chimneys fail to produce . . . eliminates condensation on gas, pulsating or chattering on oil units . . . can be installed vertically as shown.



ON FLOOR FURNACES **quickdraft** overcomes poor draft due to small chimneys or long, level smoke-pipe runs . . . prevents condensation with gas, pulsating and sooting with oil-fired units.



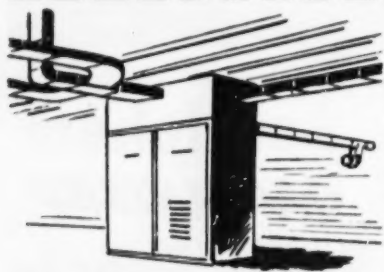
GAS, OIL AND COAL HEATING UNITS of all types need **quickdraft** to assure the constant draft required for efficient combustion.



INCINERATORS can be vented safely, with furnace and hot water heater, through **quickdraft** into same chimney . . . assuring efficient performance of all three by increasing flue capacity.



FIREPLACES can be kept from smoking and sooting by using **quickdraft** which will also assure a dancing flame.



quickdraft solves domestic and commercial heating plant problems due to faulty drafts caused by UNDER-SIZE FLUES, LONG SMOKE-PIPE RUNS, ELBOWS IN SMOKE-PIPE OR ANGLES IN CHIMNEY.

Wherever you find heating installations like these,
do your customer a favor by recommending

quickdraft

THE DRAFT CREATOR THAT ASSURES CONSTANT DRAFT AT ALL TIMES

Write for complete details

Patents Pending

QUICKDRAFT COMPANY

DIVISION OF THE HALL'S SAFE COMPANY, INC.

1640-D CLEVELAND AVE., N.W.

CANTON 3, OHIO



No obstruction
in smoke pipe

"AMERIVENT installs faster... lots faster!"

says Ray Fischer, Fischer Engineering Co., Oklahoma City, Okla.

*"that's why we are using
AMERIVENT Double-wall Vent pipe
on all gas furnaces and water
heaters in*

*2800-UNIT
LOMITA VILLAGE"*



LOMITA VILLAGE
SAN DIEGO
CALIFORNIA

Ray Fischer's experience with Amerivent is not an unusual one. More and more heating and plumbing contractors are discovering the remarkable speed—and economy!—with which Amerivent INSULATED flue pipe is installed.

Amerivent's patented SNAP-LOCK joint eliminates mastic, cement, screws and tools; its light-weight aluminum construction does away with handling problems. Result: faster, less expensive installations, often with smaller work crews.

Amerivent also eliminates expensive service calls to correct complaints of hot walls, discolored paint, mildewed plaster, etc. Simply install Amerivent—then forget it!

"... and AMERICAPS, too!"



"There's a reason why I used Americaps exclusively in Lomita Village," says Ray Fischer. "They are the only vent caps I can be sure will always prevent back-draft, the cause of most pilot-light failures. With Americaps, I never have complaints."



SOLD NATIONALLY THROUGH YOUR LOCAL SUPPLIER



American metal products co. inc.

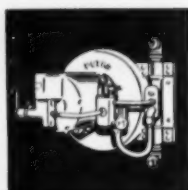
2011 Compton Avenue • Los Angeles 11, California



*You are never afraid
to answer
the phone...*

Industrial Oil Burners

Rotary type. Burn low-cost, heavy fuel oil with complete reliability. Models for every industrial need. Capacities up to 200 gallons per hour.

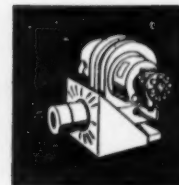


Combination Oil-Gas Burner

This commercial industrial burner is the answer to seasonal fuel shortages. Makes possible advantages in economical fuel buying.

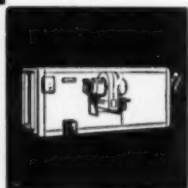
Residential Furnaces and Boilers

Made in popular sizes to fit the heating needs of homes from 4 to 10 rooms. Extremely compact and attractive. Real fuel savers.



Horizontal Furnace

Hang it or hide it—this winter air conditioner fits anywhere. Available in five models from 80,000 to 180,000 Btu's output at bonnet.



Write to **PETRO**

3245 W. 106th St., Cleveland 11, Ohio
In Canada: 2231 Bloor St., West, Toronto, Ontario

WHEN YOU SELL **Petro** OIL BURNERS

dependable heating for 50 years

Simple, Money-Saving Operation

Petro oil burners cost the plant operator or homeowner less to own and operate because their performance is proved and simple. The fine reputation Petro equipment enjoys, and its popularity with owners, is the result of this simplicity and traditional dependability.

Complete Line

There's a size and type of Petro oil burner, or home furnace or boiler, to fit every oil firing need. The name Petro, since 1903, has been known and respected wherever oil burning equipment is used.

Industrial and Commercial Oil, Gas and Combination Oil-Gas Burners. Residential Oil Burners, Oil and Gas Furnaces and Boilers.

Easily Installed

Petro oil burners are compact and well built. Heavy mounting flanges, protected wire connections, easy access to oil and ignition lines, are all features which help make Petro oil burners the favorite of contractors and dealers all over the nation. They save installation time—they cut service calls.

Get Latest Information

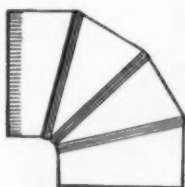
Illustrated literature and specification sheets gladly sent free. Write Petro, 3245 West 106th Street, Cleveland 11, Ohio.

PETRO

T.M. Reg. U. S. Pat. Off.

50 YEARS OF

LEADERSHIP IN AUTOMATIC HEATING



90° Adjustable Elbow,
4-piece



Vertical Diverter

EXCELSIOR

THE COMPLETE LINE

Galvanized Pipe, Elbows, and Angles

Gravity Warm Air and Return Air Fittings

Forced Air Ducts and Fittings for —

Standardized Take-Off System

Extended Plenum System

Perimeter Heating System

Small Pipe High Velocity System

**Stainless Steel Chimney Liners for
Gas Heat Installations**

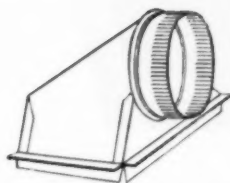
Blued and Walnut Stovepipe and Elbows

Gas Diverters and Sheet Metal Specialties

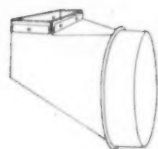
for

"Quality, Service, and Profit"

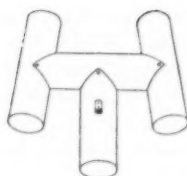
Consult Excelsior on Your Requirements



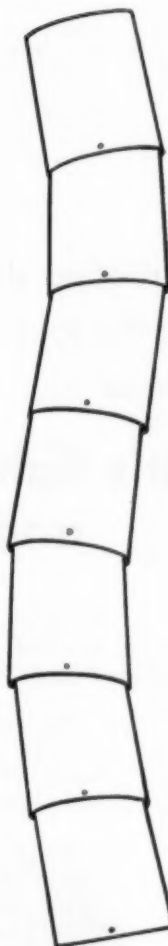
No. EP3 Top Take-Off
Fitting Square to Round



No. 710 Boot



Style A Chimney Top



Flexible Snake Section for
chimney offsets, stainless
steel, 7-piece, 48" long

Write for new 1953 Catalog 9A for details and prices on complete line

THE EXCELSIOR STEEL FURNACE COMPANY



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EXCELSIOR HEATER & SUPPLY DIV.
The Excelsior Steel Furnace Company
879 Hersey Ave., St. Paul 4, Minn.
Telephone: NEstor 7255

Phone: FRanklin 2-8120

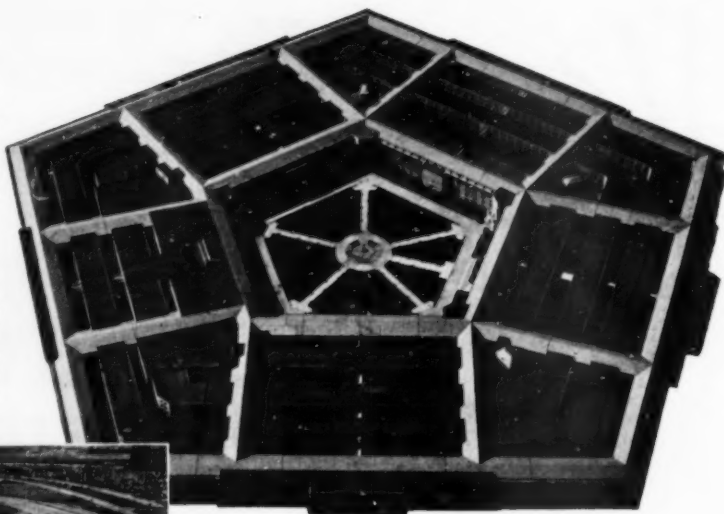
BREX & BIELER DIV.
The Excelsior Steel Furnace Company
229 Marion St., Brooklyn 33, N. Y.
Telephone: GLENmore 2-7881

CHICAGO 6, ILL.

EXCELSIOR HEATING SUPPLY DIV.
The Excelsior Steel Furnace Company
2 East 3rd. St., Kansas City 5, Mo.
Telephone: VICTor 3715

FOR PROTECTION, old gutters on Washington's Pentagon Building were replaced in 1949 with gutters of Monel Roofing Sheet. Although sheet only .025 in. thick was used, the gutters are safe from damage by heat, cold, rain, snow, ice and airborne corrosives.

A RIVETED AND SOLDERED section of Monel Roofing Sheet is installed in the built-in gutter of the Pentagon's outer perimeter. Contractor, Rupertus Sheet Metal Works, Washington, D. C., reports: "Some of the gutters were 55 inches in girth, but Monel was easy to fabricate and install."



A roofing sheet
for the jobs
ahead



it's light and easy to handle ... it's **Monel!**

Extra-large gutters drain heavy rainfall from the tremendous roof areas of Washington's famous Pentagon Building.

Think of putting these big gutter sections all around the outer edges of the Pentagon. And then around the inside court. You *could* run into a lot of fabricating and installation problems.

But the RUPERTUS SHEET METAL WORKS, of Washington, did the entire job without trouble. They report "while some of the gutters were 55 inches in girth, Monel® was still easy to fabricate and install."

Now you may have heard that Monel Roofing Sheet is strong and tough.

That's true. *But Monel has a special roofing temper.* This makes it easy to work with, to cut, bend and form. With Monel, you don't have to worry about cracking, even when you make sharp bends. For a neat soldering job, you pre-tin the sheets in the shop. Then, when you make the actual installation, a heavy, hot iron assures a tight, perfect seam.

With Monel overhead, your customers get a roof that's trouble-free. Salt air, smoke and chemical fumes can't hurt it. High winds can't pry it loose, and heavy loads of snow and ice can't make it sag. That's the kind of roof you can be proud to say you installed!

Right now, with nickel alloys vitally needed for defense, the use of Monel for building purposes is not permitted. In time, though, Monel will be back. Learn how easily you can handle it by sending for your **free** copy of the helpful bulletin especially prepared for roofing contractors — *Instructions for the Soft Soldering of Monel Roofing Sheet*. There's no telling how soon it may come in handy.

THE INTERNATIONAL NICKEL COMPANY, INC.
67 Wall Street, New York 5, N. Y.

Inco Nickel Alloys



Monel ... "for the life of the building"

Forecast: Fair & Warmer

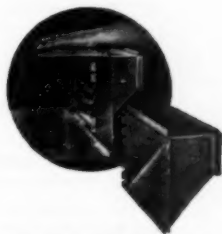


HOW'S THE WEATHER IN YOUR HOUSE?

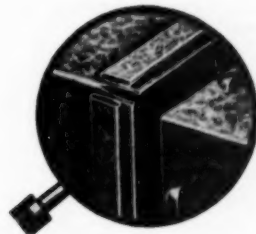
We needn't tell *you* there's lots more to interior comfort than blowers, dampers, stackheads, and registers. There's that little matter of quiet, inner, happy satisfaction a man derives from turning an extra honest dollar from a day's work well done.

Adelta specializes in the kind of ducts, pipes, and fittings that spell extra honest dollars *and* interior comfort. And no wonder! To the homeowner they mean the finest double-seamed, leak-proof duct and fittings money can buy. To the man who does the job they mean less work, more time and money saved, fair and warmer business weather the year 'round.

If you'd like to be weatherwise *and* businesswise, you can be both with Adelta.



ORIGINAL PRE-NOTCHED COLLAR EDGES—save time on every collar connection. Easily locked by finger pressure, eliminating notching and hammering.



EXCLUSIVE ONE-PIECE SNAP-LOCK CLEAT—formed as part of every Adelta unit, not just welded, riveted, or crimped. Leading edge tapered for faster, easier assembly.

MANUFACTURING CO., INC.

2103 Ellsworth St., Philadelphia 46, Pa.

Standardized Pipe, Duct, and Fittings

Write for General Catalog 453, Perimeter Catalog 353.





**"Cuts anything, gives
greatest accuracy.
We use SKIL Saws exclusively!"**

says **E. J. Griser, foreman, Elwin G. Smith & Company, Emsworth, Pittsburgh, Pa.**—Specialists in roofing and siding fabrication for commercial and industrial buildings.

Cutting metal or other special materials? Then read about this firm that cuts aluminum, asbestos, cement products, transparent plastics, plastic skylight material and galvanized sheet metal, using SKIL Saws and SKIL special purpose blades—exclusively.

"We've had such great success with SKIL Saws that we've standardized on this famous

make," says Foreman Griser. "We now have 100 SKIL Saws in constant use in the shop and in the field.

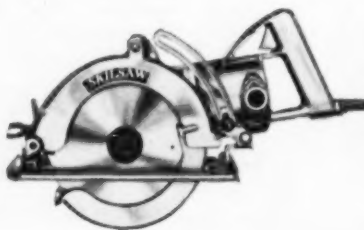
"Their fine precision cutting and durability for continuous rough use on such materials as corrugated aluminum and galvanized sheet steel are outstanding. No matter what your cutting problem, there's a SKIL Saw and blade to do it!"

Ask About the Complete Line of SKIL Saw Blades—Standard and Special Purpose

**For Complete Information
See Your SKIL Distributor or Call
Your Nearby SKIL Factory Branch**

SKIL
PORTABLE TOOLS

Made only by SKIL Corporation
formerly SKILSAW, Inc.
5033 Elston Avenue, Chicago 30, Illinois
3601 Dundas Street West, Toronto 9, Ontario
Factory Branches in All Leading Cities



George Teapole Crosscuts Corrugated Aluminum with a Model 825 SKIL Saw and a friction blade. "You can see the cut with a SKIL Saw," he says, "a must for accuracy!"



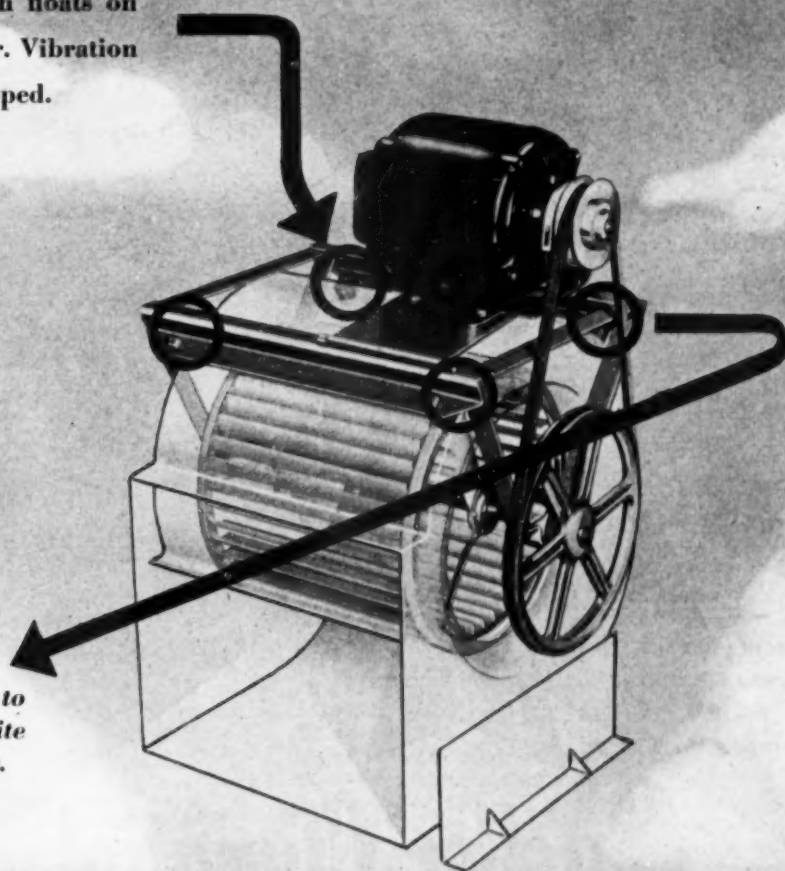
Ralph Wise, Superintendent, Uses a Model 825 SKIL Saw for on-the-job cutting. He emphasizes, "This saw lets us trim odd pieces with accuracy. This corrugated material is usually hard to cut because of its uneven surface. Here, I get a smooth, accurate cut. And SKIL's compactness and power give me the cut in least time."

Model 825 SKIL Saw—Powerful, heavy-duty. Ideal where constant use is required. With special SKIL blades, cuts $\frac{1}{2}$ " aluminum, copper and lead sheets, other metals, stone and composition. Capacity in wood: $2\frac{3}{4}$ ". Blade speed, 3000 r.p.m.; 850 r.p.m. available at extra cost. Depth and bevel adjustments. Ball bearings throughout.

The **LENNOX** *Floating Blower*

ENGINEERED AND BUILT BY THE LENNOX FURNACE COMPANY

All moving parts are mounted on a superstructure which floats on tough, resilient rubber. Vibration is killed, sound is stopped.



For blower parts made to your requirements, write Morrison Products, Inc.

MORRISON PRODUCTS, INC.

16816 WATERLOO ROAD • CLEVELAND 10, OHIO

New! Beautiful!

now with 13 star features
that make it
easier to sell, easier to install



BOTH LONG AND SHORT
MODELS FOR CONVERTING
ALL SIZES AND STYLES
OF FURNACES AND BOILERS

Mueller Climatrol Type 501 Gas Conversion Burner

...a real profit-maker for extra business

Here's the newest, most beautiful, best performing gas conversion burner on the market. It's a burner jam-packed with features — to make it easier to sell, easier to install. It's backed by a hard-hitting promotional program which is sure to increase your sales volume and profits — and, it's the only gas conversion burner with the 13 star features.

Yes, here is the new Mueller Climatrol Type 501 — another outstanding contribution from the Big Name in Heating for greater home comfort, assured customer satisfaction; here is your star profit producer — if you get behind it.

Check a few of the many outstanding features of the new Type 501 as listed below; here's real evidence of superiority.

1. More "eye" appeal — styled by world-famous industrial designer, Brooks Stevens. Finished in gleaming-white, baked enamel.
2. More "buy" appeal — backed by Mueller's big "Tell the World" advertising and promotional campaign.
3. Easier to install — has built-in air-tube; no internal bricking or hearth required. Long or short models to fit most every furnace and boiler.
4. AGA listed — in wide range of sizes — 125,000-250,000 Btu input per hour.
5. Stainless Steel Flame Spreader — will not burn out, crumble, or crack. Protects burner port from clogging due to falling scale.
6. Continuous ring, deep-slotted burner — cast-iron construction, provides greater efficiency.

There are many other features illustrated in the new Type 501 Facts and Figures Bulletin — write for a copy today, or see your Mueller Climatrol wholesaler. Start your plans now to cash in on extra sales volume, more profits — by pushing the Type 501.



MUELLER CLIMATROL • 2030 K W. Oklahoma Ave. • Milwaukee 15, Wisconsin

ASSOCIATION NEWS —

(Continued from page 113)

George Anderson — Condensation Engineering Corp.
 Larry Ingham — Aire-Flow Heating Co.
 Will Pennington — Dole Valve Co.
 S. C. Savage — Crosstown Heating Co., Inc.
 K. E. Jensen — Kirk & Blum Mfg. Co.
 Mel Jackson — Grant Wilson, Inc.
 Harry Duerst — Lennox Furnace Co.
 Jim Shanell — Minneapolis-Honeywell Regulator Co.
 Harry Himelblau — Himelblau Associates, Inc.
 G. Crowner — Perfection Stove Co.
 H. N. Anderson — Dole Valve Co.

Blind Bogey

Bert Engstrom — Warren Barr Supply Co.
 Wally Carlsen — Benjamin Wolff & Co.
 Bill Wallin — Dole Valve Co.
 Warren Barr Jr. — Warren Barr Supply Co.

Non-Golfer

Charles R. Akinston — L. E. Schulein Co.

Plans for holding the third and final tournament of the 1953 season were discussed in an after-dinner business session. The date of September 29th was decided upon and the place is to be the Ruth Lake Country Club. The largest attendance of the season is expected.

Canadian Chapter Holds Convention in Toronto

THE TENTH ANNUAL convention of the Canadian chapter of the National Warm Air Heating & Air Conditioning Association was held in Toronto, June 4 and 5. Over 120 delegates were in attendance at the King Edward Hotel for "Associate Members Day," June 5.

In his opening address to the convention, C. E. Israel, president, expressed the hope that this would be the first of many meetings at which manufacturer members met with associate members to discuss mutual problems. "The increasing preference for warm air heating is proof of the successful teamwork which has existed between the dealer and the manufacturer," he said.

C. B. Taylor, managing director, outlined the story of NWAHACA in his talk, *Ten Years in Ten Minutes*. He stressed the fact that over \$200,000 has been spent by the association on the improvement of the industry. Discussing the chapter's educational program, Mr. Taylor traced the school development from the initial school in 1945 to the present program, which includes a minimum of 12 schools annually. To date, he said, 79 schools have been sponsored by the association, and 3666 delegates have attended.

W. D. Redrup, president of the U. S. association, urged the delegates to sell home comfort rather than price. "The heating system is the most important single piece of equipment that goes into the home," he said. In measuring the progress made by NWAHACA he said, "We have not even begun to reach our goal and probably never will reach it, but great progress has been made."

"Good public relations puts dollars in your pocket" was the theme adopted by Don Henshaw. After citing many instances where good public relations can mean increased profits, he stressed the point that public relations starts within the company. A telephone operator

Mueller Climatrol Tells the world...

to bring you
MORE customers
LARGER profits!



Sure, we have a reason for it. The more we talk about Mueller Climatrol advantages, the more you sell. So it's just good business for us to back you up in the most helpful way we can — by national advertising.

This year more than 85 million, yes that's 85 million, people will see beautiful, two-color Mueller Climatrol advertisements in *Better Homes & Gardens*, *Household*, *House Beautiful*, *Living for Young Homemakers*, *Small Homes Guide*, and *Home Modernizing*. These messages are all aimed at home owners, people interested in homes and home furnishings and equipment — your best prospects.

As part of the Mueller sales team, you find cooperation all the way in building up your sales — a complete packaged program from Mueller's advertising experts — all designed to help make you the Big Name in Heating in your area. Write today for more details about the strong advertising support Mueller gives you — and how you can join the Mueller family.

D-148



Mueller Climatrol

2030K West Oklahoma Ave. • Milwaukee 15, Wisconsin

When it's a call for a **FORCED AIR FURNACE...**



There are **3** ways
you can profit more with **bryant**

1. You can profit more on the initial sale! All Bryant Forced Air Units are available to you at attractively low, margin-boosting prices.

2. You can make an extra profit! Today, many furnace sales present an opportunity to sell air conditioning as well. There are two Bryant lines of central cooling units—vertical and horizontal—to satisfy your need for a broad range of products that meet all requirements of cooling, space and price. It's a single source of supply for the complete job. And you can sell this broad line for installation with all Bryant Forced Air Furnaces—a most practical and positive profit opportunity for you.

3. You can maintain your profit! Bryant is famous for quality—and good quality means decidedly fewer, profit-shrinking “call-backs”.

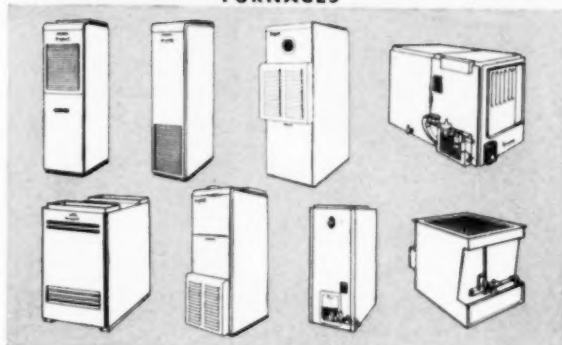
And Bryant helps you sell! To strongly supplement Bryant's extensive national advertising program, Bryant heating and air conditioning literature will be sent to over 80,000 families definitely known to be building new homes within the next 12 months. Names of these families in your area will be supplied to you—another reason to investigate this handsome, 3-way profit opportunity today.

Contact your Bryant distributor for complete information or write: Bryant Heater Division, Affiliated Gas Equipment, Inc., 17825 St. Clair Avenue, Cleveland 10, Ohio.

Profit with the name that everybody knows...

THE MOST COMPLETE LINE OF HOME CONDITIONING EQUIPMENT IN THE INDUSTRY

FURNACES



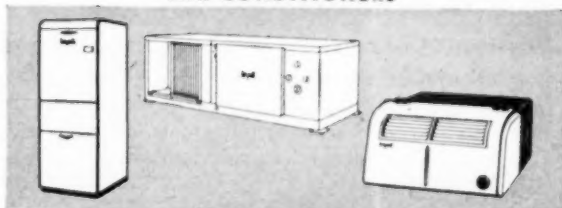
BOILERS



WATER HEATERS



AIR CONDITIONERS



SPACE HEATERS



bryant®

or sales girl is often the deciding factor in a business transaction, he pointed out.

C. W. Nessell, Minneapolis-Honeywell Regulator Co., spoke on *New Clothes in the Wardrobe of Warm Air Heating*. He dealt primarily with the warm air perimeter heating system, and pointed to the revolution in housing construction as being largely responsible for the development of this type of heating.

J. M. Martin, director of industry relations, discussed the association manuals. "The manuals have removed the 'guesstimations' from heat loss calculations and furnace sizing," he stated. "They have provided the contractor with a correct method of calculating heat loss and the size of furnace required for each job."

T. A. Clark, technical director, presented a chart comparing the National Warm Air Heating & Air Conditioning Association to a continuous winter air conditioning system. The chart shows the research and technical advisory committees as the return plenum of the system collecting research data from three return ducts which represent the various research laboratories. The blower of the system represents the educational advisory board which draws research data through the filters which are analogous to the code committees of the association and, after the data is written in manual form, delivers it to the supply plenum. The association's central offices in Cleveland and Toronto, being the distribution centers of the organization, are shown as the supply plenum of the system. The supply plenum is connected to three main trunk ducts serving the distribution system which consists of the college short courses and indoor comfort conferences.

Officers elected are: president, C. E. Israel; vice president, F. A. Sheldon. Directors are L. C. Whealy, H. T. Williams, F. R. Rand, H. T. Bulloch, and H. H. Proctor.

BOOT FITTING —

(Continued from page 82)

(13) Extend lines U-V and R'-N'. Measure $\frac{1}{4}$ in. and locate points W on lines U-V and points Z on lines R'-N'. Draw lines W-Z.

(14) With points S and T on Fig. 4 as centers and distance P-R ($1\frac{1}{4}$ in.) from Fig. 3 as radius, draw arcs. Transfer the distance of arc N-R from Fig. 3 to the arcs just drawn, starting at points R'. Mark the new points found also as N'. Draw lines from points N' to points S and T.

(15) From lines N'-S, S-T, and T-N', measure $\frac{1}{4}$ in. and draw the flange outline.

Add allowances for seams and joints and mark the pattern for fabrication. Note that the back seam is shown for rivets. A double hammered seam can be substituted. The Pittsburgh lock around the arc will be a hand formed operation. This can be substituted for a lap seam spot welded or soldered.

50,000 homes built in the past year
had this mark of a better home

Van-Packer

Genuine Safety
CHIMNEY

Do the *complete* installation—furnace and chimney. Takes only 3 hours or less to install Van-Packer. No service required. Makes central location of heating plant possible—shorter heat runs—greater fuel savings. Underwriters' listed for all fuels. F. H. A. and code accepted. No delays on the job. Immediate delivery. Everything furnished. Send the coupon.

FIRE-SAFE
INSTALLS
IN 3 HOURS
LASTS
A LIFETIME

VAN-PACKER CORPORATION

DEPT. 3 • 209 S. LaSALLE STREET
CHICAGO 4, ILLINOIS

Please send me your latest, complete circular on Van-Packer Packaged Masonry Chimney.

Name _____

Address _____

City _____ State _____

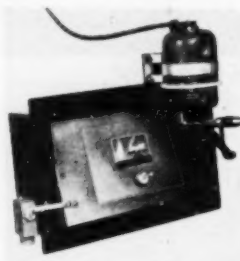
Name of Firm _____

Also Manufactured and Distributed in Canada by
C. A. McRobert and Son, Ltd., St. Laurent, Quebec.

EQUIPMENT DEVELOPMENTS —

(Continued from page 117)

Thus, at the point of peak heat, the chimney is forced to make most of its pull from the room rather than from the combustion chamber of the heating plant.



Above: Draft control



Right: Furnace

Counterflow Furnace

MODELS LB-15JD and LB-20JD oil-fired counterflow furnaces, in sizes of 60,000 and 85,000 Btu per hr, respectively — General Electric Co., Home Heating and Cooling Dept., 5 Lawrence St., Bloomfield, N. J. Designed for use in basementless homes, the furnaces are factory-wired and assembled. They can be installed in a closet or utility room, requiring 1 in. of clearance on the side and 2 in. in the front and back for closets. The front panel lifts off for servicing. A flame detector device shuts down the units immediately if the oil flame fails. The smaller furnace is 21 in. wide, 30 $\frac{1}{8}$ in. deep, and 55 in. high. The larger is 25 in. wide, 30 $\frac{1}{8}$ in. deep and 55 in. high.

Warm Air Baseboard

IMPROVED "AIR-GUIDE" baseboard with increased cross sectional area for greater capacity — S. R. Roberts Co., Box 1, Marshall, Mich. The baseboard will now handle such installations as schools, restaurants, churches, etc.,



and will handle the required amount of air for summer cooling as well as for heating. The slightly increased width allows a standard 2 $\frac{1}{4}$ x 14 boot to be used for connecting the heat run. The inlet section is now pre-cut, ready for the supply installations. Built-in air deflectors have been added to the inlet section which are designed to assure even distribution of air throughout

When you Compare Air Filters . . .

FEEL

**THE FILTER
PACK!**



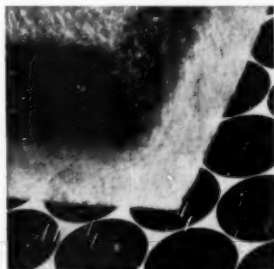
The soft, silky glass fibres are easy on the hands—and really stop Dust! The *magnified* view of the Glasfloss filter pack above shows why the long, fine curly fibres provide efficient filtering action. This fluffy, resilient mass provides an intricate maze of air passages with a greater surface area to catch and hold more dust throughout the entire pack. **RESULT:** Longer life, less changes, lower cost.

Glasfloss **DISPOSABLE AIR FILTERS**

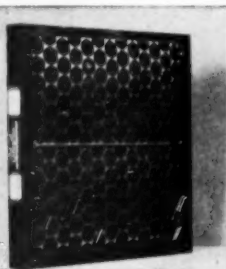
- Hold more dust at higher efficiency
- Less resistance to the passage of air
- Insure greater air capacities
- Easier to handle during installation and removal
- Tough and resilient
- Highly fire resistant
- Moisture-proof

Glasfloss
**MAKES A COMPLETE
LINE OF
DISPOSABLE
AIR FILTERS**

Descriptive literature on request—
Address Dept. AA-9



GLASFLOSS I-S
for heavy industrial use



GLASFLOSS STANDARD
the all-purpose filter



GLASFLOSS ROLL-PAK
for economical bulk use

Glasfloss

155 EAST 44th STREET, NEW YORK 17, N. Y.

equipment developments . . .

the length of the base. Air will be evenly distributed 12 ft on each side of the inlet. Deflectors also reduce air resistance by streamlining the air flow between the boot and the baseboard. Sections 4 ft long permit the baseboard to be used in single lengths as individual perimeter diffusers if desired, or several sections can be joined to cover the entire outside wall.

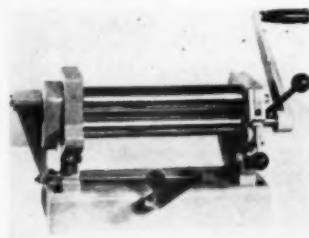
Adapter Pipe for Draft Control

"E-Z 'DAPTER" ADAPTER PIPE for draft control installations — Windmaster Corp., 897 Ingleside, Columbus. It is designed for use with the company's "Bard-On" draft controls, and is intended to simplify installation, eliminating the need for cutting a hole in the smokepipe and guaranteeing full size opening into the pipe. It comes already cut and flanged, with pipe crimp on one end. The adapter fits together without hammering.

Warm Air Furnace

MODEL OBC-75H low cost warm air furnace which features wrap-around casing and simplified construction — Delco Appliance Div., General Motors Corp., 391 Lyell Ave., Rochester 6, N. Y. It features a pressure-atomizing oil burner, a 16 gage heat transfer unit (seam welded), a stainless steel combustion chamber, a heavy duty steel cabinet, and a large capacity blower. It is designed for

application in closet, utility room, or basement. Capacity is 75,000 Btu per hr output at plenum.

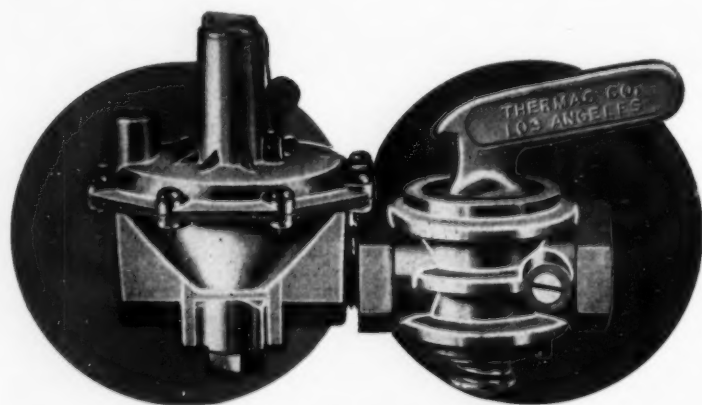


Above: Rollers

Left: Furnace

Hand Operated Rollers

SIX NEW MODELS of a hand operated "Di-Acro" roller, with material capacity ranging from 16 to 24 gage sheet steel, forming width ranging from 12 to 42 in., and a minimum radius capacity of 2 in. — O'Neil-Irwin Mfg. Co., 501 8th Ave., Lake City, Minn. They incorporate a cam idler feature which makes it possible to form circles of any diameter in two passes through the rolls, the company states. Circles of the same diam-



APPLIANCE REGULATOR

Here's the famous Thermac "T" Series Regulator used on millions of gas appliances. Use it now in conjunction with the THERMAC Main Gas Shut-Off Valve.

- ① Lower cost per BTU capacity
- ② Greater BTU capacity per size
- ③ Small octangle body easy to install
- ④ Greater diaphragm sealing area prevents leaks

GAS SHUT-OFF VALVE

Costs considerably less yet it is 2 to 3 times stronger and greater in capacity than ordinary gas control valves. This new Thermac valve, made of special high tensile aluminum alloy long proved in aircraft practice won't gall or stick. Valve rotor is treated with a hard facing and special long life lubricant. Pilot gas take-off may be provided on either side. Appliance manufacturers are invited to request samples and quantity prices.

Certified by A.G.A.

**Thermac
NOW
offers you
these
2
products**

Use Thermac Regulators and Shut-Off Valves together for greater economy.

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AMERICAN ARTISAN, SEPTEMBER 1953

Firomatic

PRODUCTS

VALVES • FUEL OIL FILTERS • SAFETY DEVICES



FIROMATIC FUEL OIL FILTERS

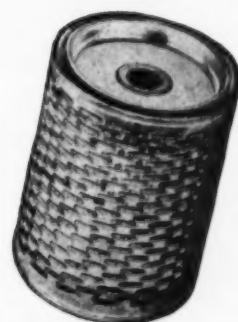
For Highest Efficiency . . . Fewer
Service "Call-backs"!

Firomatic Fuel Oil Filters
are available in capacities
up to 25 G.P.H. or up
to 19 G.P.H.

Both you and your customers will profit when you install Firomatic Fuel Oil Filters. Their greater capacity and filtering area keep burners operating efficiently, prevent flame failure, oil leakage, and sluggish operation. You'll profit on fewer "call-backs" . . . your customers save on increased burner efficiency.

SEND FOR NEW FULL LINE CATALOG "A"

"You Can Pay More, But You Can't Buy Better"



Coated steel Firomatic
Cartridges remove *all*
harmful impurities from
oil . . . need replacing
only once a year.

THE MORSE-SMITH-MORSE CO.

145 Dexter Avenue
Watertown, Mass.

SOLD NATIONALLY
BY JOBBERS ONLY



TRY THESE NEW CHAMPION SMALL PIPES AND FITTINGS

Now you can select from a complete line of small and perimeter pipe and fittings for either extended plenum or individual pipe systems. What's more — each piece will guarantee you the easy, labor-saving fittings that originally made Champion's conventional units famous.

IT PAYS TO STICK WITH CHAMPION

Each piece precision made. It looks better — *is* better . . . because it saves time and labor. Simplify your jobs — try Champion on the next one and *see*.

GET THE NEW EASY TO READ CATALOG



Get Champion's new general catalog — makes ordering simple and quick. Shows complete line of small, perimeter and conventional pipe and fittings. Write now.



equipment developments . . .

eter as the forming rolls or slightly larger can be formed in one pass through the roller if a slight adjustment is made. Bends also can be located in any position along a sheet of material being formed in the roller, since the material can be fed through the rolls without bending until the cam lever is engaged.

Twin Units for Year 'Round Conditioning

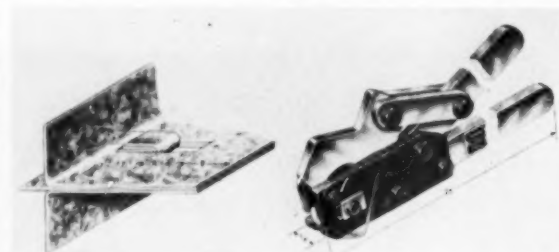
"COMMAND-AIRE" twin units for year 'round conditioning, engineered for both the new home and replacement markets — Bryant Heater Div., Affiliated Gas Equipment, Inc., 17825 St. Clair Ave., Cleveland 10. Units may be installed separately. Installation of the heating unit may



be followed at a later date by the addition of the cooling unit without the need for adding ducts or making other alterations. The units utilize either gas or oil. Separate blower systems in each are designed to assure the proper delivery of air for heating and cooling, to provide for better dehumidification control, and to prevent overloading of the furnace blower.

Clip Punch

"Two in One" universal clip punch designed to punch through three sheets of 20 gage mild steel, flatten out the

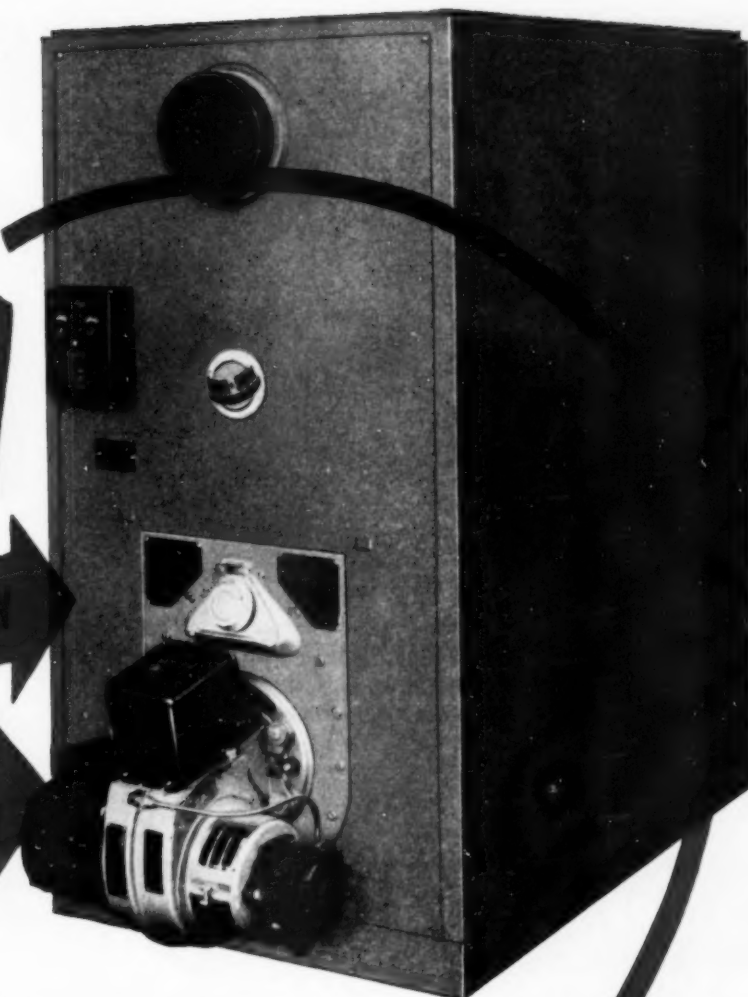


lug, and squeeze the metal together as if riveted, in one operation — Thor Tool and Die Co., 865 Estabrook St., San Leandro, Calif. These operations are performed as the handles are closed and opened. The weight of the tool is 4 lb with aluminum handles, 7 lb with steel

IT'S NEW

READY FOR DELIVERY

LOW IN COST...
HIGH IN EFFICIENCY



Sell more warm air installations...get a bigger share of available heating business with the new Mor-Sun series of MIGHTY LOW BOY Forced Warm Air Furnaces. Priced right for quick, profitable turnover, these new Low Boys have all the quality features of the Mor-Sun DeLuxe line...check these sales-builders:

- LOW COST...Forced Warm Air Furnace with outputs from 68,000 to 95,200 BTU's.
- 10-YEAR GUARANTEED HEAT EXCHANGER... Engineered for Maximum Heating Efficiency.
- LABOR SAVING INSTALLATION—Quick—Simple.
- COMPACT... Only 46" high, 24" wide, 35" deep.
- GAS or OIL... Burners interchangeable with No Loss in Efficiency.

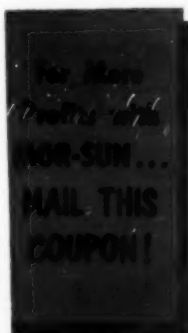
The building trades asked Morrison for a low cost, quality forced warm air furnace...here it is...Cash-in on the ready-made demand for this fast-moving Mor-Sun line of new MIGHTY LOW BOY Forced Warm Air Furnaces as a Mor-Sun Dealer. Fill in the coupon and get the whole story NOW!

**MOR-SUN FURNACE DIVISION
MORRISON STEEL PRODUCTS, INC.**

609 Amherst Street • Buffalo 7, N. Y.

Also manufacturers of Roly-Door Steel Sectional
Garage Doors and Carry-All Truck Bodies

MOR-SUN MIGHTY LOW BOY FORCED WARM AIR FURNACE



Morrison Steel Products, Inc.
609 Amherst Street
Buffalo 7, New York



Gentlemen:

Please send me complete details on Mor-Sun's new MIGHTY LOW BOYS and the Mor-Sun Plan for Bigger Dealer Profits.

Firm Name

Address

City Zone State

☐ Distributor ☐ Dealer ☐ Installer
(PLEASE CHECK)

equipment developments . . .

handles. The tools are recommended by the manufacturer for use in air conditioning, metal fabricating shops, on ductwork, etc.

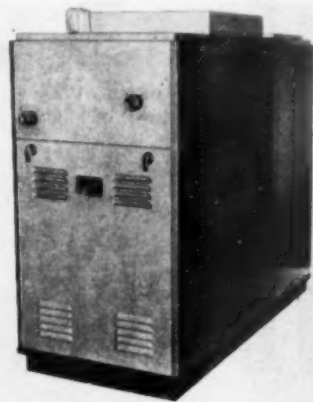
Gas Pressure Gage

GAS PRESSURE GAGE for installing and servicing gas heating equipment — Bacharach Industrial Instrument Co., 7301 Penn Ave., Pittsburgh 8. It can be connected by removing the pipe plug from the control valve or gas line between the regulator and burner, and then inserting the rubber plug of the instrument's hose assembly into the plug hole. Features include an adjustable scale which can be moved up or down to permit reading of pressure and a blower seal which automatically prevents spilling of the liquid when the gage is subjected to pressure surges in excess of scale range. The gage is available in two ranges: 0 to 7 in. water, and a reversible scale of 0 to 15 in. water range on one side and 0 to 8.5 in. on the other.

Combination Furnace-Hot Water Heater

"DOUBLE DUTY" furnace designed to combine warm air heating with domestic hot water heating — Robot Auto-Heat Corp., Newfield St., Middletown, Conn. The heat exchanger contains 14 tubes fitted in a criss-cross pattern. A baffle plate arrangement directs the flow of

heated gases from the combustion chamber through and around the heat exchanger twice. Water heating is accomplished by a finned coil located next to the heat exchanger. A propeller type fan draws heat from the combustion chamber up through the fins. Water pass-



ing through the finned tubes is heated, then stored in an aqua-statically controlled tank outside the unit. As the hot water is used, it is automatically replaced by the water heater.

Thermostat Control

"HEET-O-MATIC" night-time thermostat heat control — Automatic Controls Corp., Ann Arbor, Mich. A cali-

ALERT SERVICE MEN SAY "General" FUEL OIL FILTERS

✓ AND CHECK OFF THESE ADVANTAGES

☐ QUICK PROFIT

Generals are easy to sell because customers need GF's positive filtering protection.

☐ EASY SERVICE

Single-bolt assembly means instant, sure servicing — no time lost through troublesome "call-backs."

☐ REPEAT SALES

Seasonal cartridge changes aid in finding new filter prospects, assure lucrative, dependable earnings.

☐ SUPER-FILTRATION

Finest all-wool cartridge and GF's unique filter design mean the safest filtering known!

ANOTHER MONEY-MAKER!

CLEAN RIGHT Soot Remover works safely, gently, quickly cleans any heating plant. Made for General Filters, Inc.



2A-700
for average needs

2A-700
REPLACEABLE FELT
CARTRIDGE



1A-25
for small stoves,
heaters, etc.

Veteran fuel oil service men enthusiastically agree that GENERAL FUEL OIL FILTERS are the finest all-wool-cartridge filter money can buy! Easily replaceable felt cartridges not only reduce maintenance to a few simple steps but assure positive filtering which puts an end to unprofitable service "call-backs." One cartridge change covers the entire season. In addition, GF's quick, out-in-the-open installations save you time and money on every job.

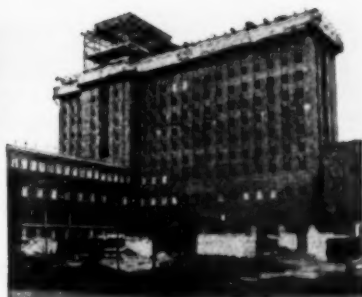


GENERAL FILTERS
INCORPORATED

CANADIAN FACTORY BRANCH: CANADIAN GENERAL FILTERS, LTD., 2679 DANFORTH AVENUE, TORONTO 13, ONTARIO

43800 Grand River Ave.
Novi, Mich.

MODEL 450 REMINGTON STUD DRIVER



*Simplifies construction fastening
in new medical center*

Contractors use ten Stud Drivers for fastening in steel and concrete

Contractors for University of Minnesota's new Mayo Memorial Medical Center gave the Remington Stud Driver a real workout. They used 10 of these powerful tools to install ventilating duct-work and to anchor 2,500 metal door bucks to concrete. Door bucks were set separately, walls finished later. This meant plenty of open space for moving in equipment and other material.

For fastening 900 window frames, Remington Stud Drivers again proved fast and convenient. Workmen found the rugged 5½-lb. tools easy to handle, simple to operate. They liked the fact that there were no wires or hose to get in the way as they worked from frame to frame. And every stud was driven arrow-straight—thanks to the precision power supplied by 32 caliber cartridges.

Can the Stud Driver help you?

Your local distributor will be glad to show you the Remington Stud Driver in action—on concrete, brick or steel. Find out how you can cut construction costs and speed fastening jobs. For the name of the distributor nearest you and for full information about this modern fastening system, send in the coupon below.

MAIL THIS COUPON TODAY

Industrial Sales Division, Dept. AA-9
Remington Arms Company, Inc.
939 Barnum Ave., Bridgeport 2, Connecticut

Please send me free copies of the new booklets showing how I can cut my fastening costs — and the name of the distributor nearest me.

Name _____
Position _____
Firm _____
Address _____
City _____ State _____



"If It's Remington—It's Right!"



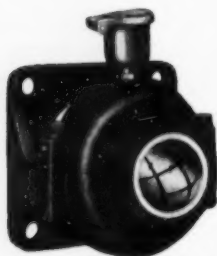
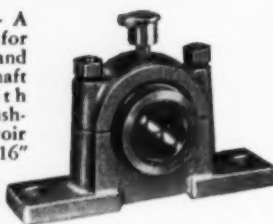
Remington



Listed & Approved by Underwriters' Laboratories, Inc.

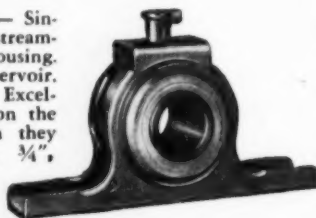
THERE'S A RANDALL PILLOW BLOCK FOR EVERY TYPE APPLICATION

Normal Duty Pillow Block — A general service pillow block for normal duty on small shafts and for heavier duty on larger shaft sizes. Double-lubricated with graphited, phosphor bronze bushing in wool packed oil reservoir housing. For shafts $\frac{1}{2}$ " to 3 $\frac{15}{16}$ " inclusive.



Flange or Side Mount Pillow Block — A top quality pillow block built for the most exacting service. Double-lubricated with graphited phosphor bronze bushing in wool packed oil reservoir housing. This pillow block is widely used in unit heaters, cabinet type air conditioning units. Side mounting only. For shafts $\frac{1}{2}$ " to 1 $\frac{15}{16}$ " inclusive.

Sintered Bushing Series — Sintered bronze bushings in streamline one-piece steel housing. Wool packed oil reservoir. Mounts in any position. Excellent for general service on the smaller shafts for which they are available, $\frac{1}{2}$ ", $\frac{3}{8}$ ", $\frac{3}{4}$ ", $\frac{15}{16}$ " and 1".



Write for catalog No. 109.—For additional information on these as well as other one piece or two piece pillow blocks available for light, normal or heavy duty. There's a Randall Pillow Block for every type application.

BRONZE BAR STOCK
BRONZE BUSHINGS
PILLOW BLOCKS
SHEET LUBRICATOR



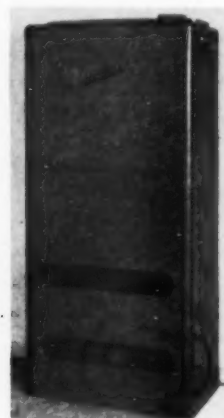
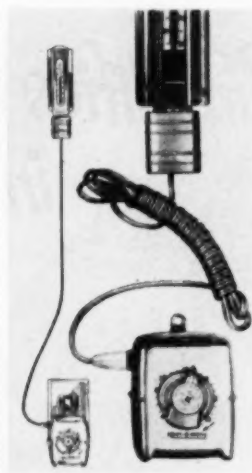
GRAPHITED BEARINGS
THRUST WASHERS
SAFETY COLLARS
BRONZE CASTING

RANDALL GRAPHITE BEARINGS, INC.

1000 S. Greenlawn Ave., Lima, Ohio

equipment developments . . .

brated time control unit plugs into the nearest outlet and a heat control unit mounts beneath the thermostat. The device automatically reduces house temperature by 10 F at bedtime, then raises it back to normal before rising time. In operation, the heat control unit, when switched on by the time control unit, increases the temperature of the air immediately surrounding the thermostat during the night.



Above: Furnace
Left: Control

Counterflow Furnace

"REV-FLO" gas-fired counterflow furnaces for perimeter heating installations — Sequoia Mfg. Co., 1000 Brittan Ave., San Carlos, Calif. They are available in 80,000, 100,000, and 120,000 Btu models. Cabinets are designed with wide-face, shallow depth, and average height, and can fit inside linen closets or wall alcoves, the company states.

Powder-Actuated Fastener

"PLUS-POWER JOBMASTER" powder actuated fastening tool for medium duty fastening into steel and concrete — Ramset Fasteners Div., Olin Industries, Inc., 12117 Berea Rd., Cleveland. It is designed for economical



operation. The barrel diameter is $\frac{3}{8}$ in., as compared with $\frac{1}{4}$ in. for the regular model. The barrels are being produced as separate lower assemblies so that they may be interchanged with those in other tools. The tool weighs 6 $\frac{3}{4}$ lb. Available for use with it are special "Tru-Set" flat head drive pins and adjustable utility head threaded studs. Studs can be set permanently at an average speed of at least two fasteners a minute, the

BASO®

Automatic SAFETY PILOTS

simple
automatic
shut-off with
rotor pilot valves
and pilot
adjustment



● In Sizes up to $\frac{1}{2}$ " for A828 and to $\frac{3}{4}$ " for the A824, these Baso valves provide simple automatic 100% shut-off, plus ability to provide pilot gas adjustment. Combining a rotor pilot valve and a pilot adjustment plate, these Baso valves are particularly useful on LP installations where a small pilot flame may be desired, as well as in places where pressure may be high. Models A828 and A824 have aluminum-alloy bodies and replaceable hood and reset assemblies and of course assure you the reliability you expect from thermocouple operation.

When you put Milwaukee Gas Specialty controls on your products, buyers know they are getting the best. That word "Specialty" means special controls, mass produced at mass production prices to meet the particular needs of one manufacturer or a thousand—to meet *your* needs and to save *you* money.

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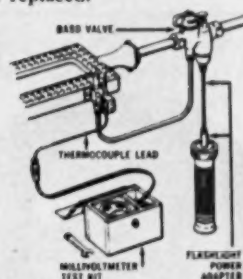
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MEN only



Thermocouple Testing with Pilot Flame

1. Short Circuit Check

Note: Make sure the main burner will not operate during these tests. Disconnect thermocouple from hood assembly. Attach millivoltmeter test kit to thermocouple and attach Flashlight Power Adapter to hood assembly. (Adapter may be obtained from Milwaukee Gas Specialty Company.) Flashlight Power Adapter is not needed where pilot gas is taken off on the upstream side of the Baso valve or is not controlled by the Baso valve. Switch on power adapter, press down reset button and light pilot burner. Allow time for millivoltmeter needle to stabilize. Bend lead slightly at various places while observing the meter dial. If the needle remains steady, there is no indication of a short circuit. If the needle moves or is erratic during the bending, a short circuit or broken wire is indicated and the thermocouple should be replaced.



2. Performance Check

The pilot flame should now be reduced gradually until the needle stabilizes at a ten millivolt open circuit reading. Disconnect the meter from the lead. Attach the thermocouple to a control known to be in good working order. Reset the control. If it holds open, the thermocouple is good. If it will not hold open, the thermocouple should be replaced.

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Milwaukee 1, Wisconsin

Please begin sending me your new Service Suggestion Cards for my file. I understand that they are free.

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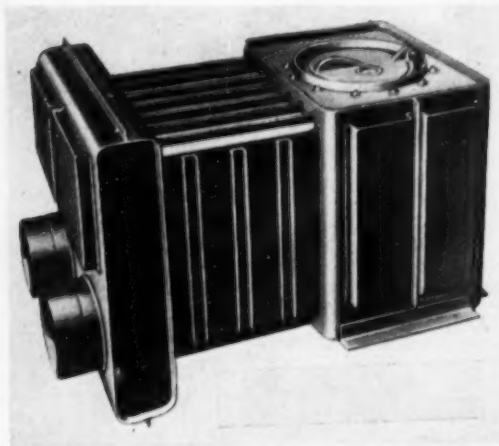
City..... Zone..... State.....

☐ Please send the name of the Baso Replacement Depot nearest me.

AA-3

equipment developments . . .

manufacturer states. The tool can be used for refrigeration insulation, heavy duct, anchoring machinery, etc.



Gas-Fired Floor Furnace

"SHALLO-WELL" gas-fired floor furnace with 90,000 Btu input rating, and 67,500 Btu output — Oran Co., 2222 S. 3rd St., Columbus 7, Ohio. The unit is designed to

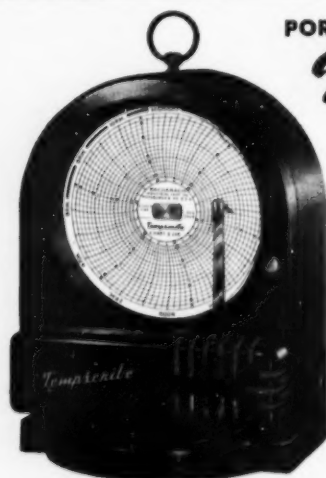
heat the small home, with or without basement, under climatic conditions encountered anywhere in the United States. Fully automatic, it has a safety shutoff valve. All controls are completely installed. The built-in air circulation fan is designed to give maximum heat output. Auxiliary cold air returns also increase heat circulation. All units are AGA approved for natural, manufactured, or LP gas.

Adsorption-Type Dehumidifier

MODEL 21 adsorption-type domestic dehumidifier — Dryomatic Corp., Alexandria, Va. Measuring 20½ in. high, 15½ in. wide, and 13 in. deep, it plugs into any standard home current supply. Applications include basements, playrooms, storage rooms, etc. A model is available with an indicator panel and a humidistat.

Combustion Head for Gun Burners

COMBUSTION HEAD for installation with gun type burners, designed to provide more heat and to eliminate carbon and soot — Oilgas Generating Burner, Inc., 410 S. Jefferson St., New Castle, Pa. The unit utilizes the principle of carburetion. Pre-heated air hits the oil spray within a few seconds of lighting, causing the oil to gasify. A flame temperature of 1800 to 1900 F is attained. The flame burns 4 in. from the spray nozzle,



PORTABLE TEMPERATURE RECORDER . . .

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"Very useful for selling installation jobs."

"Makes it easy to check proper thermostat location."

"Used all the time for balancing heating systems."

"Gives me proof of a good installation."

"Helped me discover incorrect 'night set-back' of clock thermostat in seconds instead of hours."

"Very satisfactory for recording outdoor temperature for 'degree day' operations."

"Has been invaluable as proof in settling heating complaints."

The TEMPSCRIBE Temperature Recorder gives continuous time-temperature records of room temperature or of air temperature at any specific point, such as at the thermostat, at floor and ceiling levels, and above the radiators or in front of warm air registers. The temperature graph, as recorded on a 4" chart, shows at a glance the highest and lowest temperature during the test period, duration of any temperature extreme, and frequency and spread of temperature fluctuations. The instrument is compact, self-contained; no electrical connection; requires no watching. Can be stood anywhere or hung on wall. Available in ranges to cover -30° F. to +160° F. temperatures. Choice of spring wound chart drives: 8 hour, 24 hour, or 7 day rotation.

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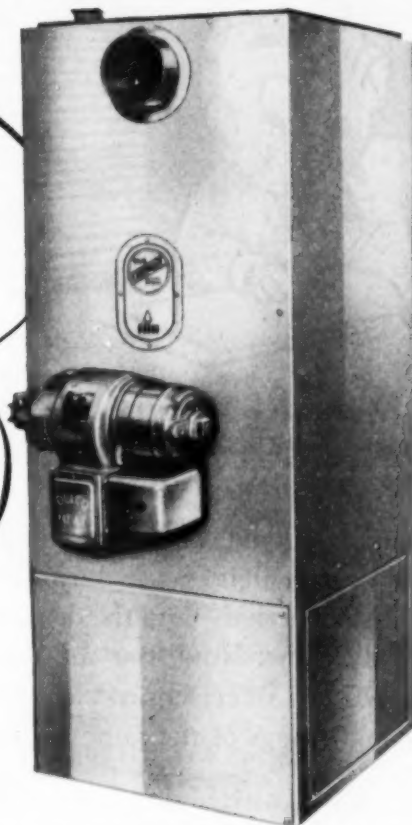
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WRAP-AROUND DESIGN FOR
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Here's the Delco-Heat answer to builders' need for a lower-priced heating plant that will permit them to make profitable installations and offset rising costs. With this unit you have a real sales-making bidding price for builders, with proper profits for you, and you can still guarantee real comfort, economy and service-free operation.

The value-leader OBC75-H Oil-Fired Conditionair has exclusive new wrap-around steel cabinet with Delco Green enamel finish. The 16 ga. steel Heat Transfer Unit is seam welded to eliminate combustion leaks. The Circle-Air Radiator adds an extra heating surface—improves efficiency. Other great Delco features are the Quik-Action stainless steel

combustion chamber; Delco-Heat Pressure Oil Burner powered by the vibration-free Rigidframe Motor; Centrifugal Blower; replaceable air filter; wrap-around wipe sheets; knockouts in side panels that permit installation of filter at either position; and base pan with knockout for floor return.

Similar in every detail, the new Model GBC90-H also meets the builder demand for a value-leader Gas-Fired Conditionair. Both models are shipped assembled for easy installation.

For more information, write or wire: Delco Appliance Division, Dept. AA, General Motors Corp., Rochester 1, N.Y. In Canada: Delco-Heat, Toronto 13, Ontario.

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QUALITY BRINGS IN THE ORDERS — SERVICE KEEPS THEM COMING

The quality of Ohio Valley furnace fittings stayed as high as ever during the limited-steel period—and the demand naturally grew. Now that material shortages are over, Ohio Valley is supplying fittings of the same highest quality.

Ohio Valley's fast, efficient service helps to bring in repeat orders. For quality, service, and fast turnover—order from Ohio Valley.

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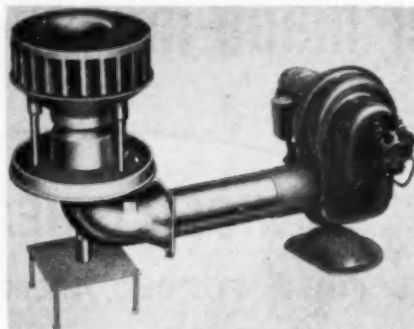
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Ohio Valley Hardware & Roofing Company
METAL MANUFACTURING DIVISION, EVANSVILLE, IND.

equipment developments . . .

preventing corrosion or carbonizing of a 45 deg spray angle "Holocone" nozzle, the company states. No ad-



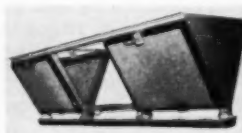
justment is required. Electrodes ignite the flame automatically. In case of combustion or electrode failure, the combustion head may be ignited by hand. No brick combustion chamber is required for installation.

Furnace Vacuum Cleaner

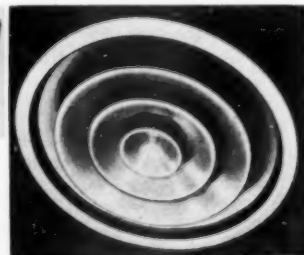
MODEL JS heavy duty vacuum cleaner designed for small size, light weight, and easy portability — National Super Service Co., Inc., Toledo Factories Bldg., Toledo. It is powered by a 1½ hp motor driving a three stage fan. The unit is quiet in operation, the manufacturer states.

Adapter for Grease Eliminator

V-TYPE SECTIONAL adapter designed for limitless, end-to-end installation of filter sections in a kitchen grease eliminator — Farr Co., P. O. Box 10187, Airport Station, Los Angeles 45. The adapter unit, of heavy gage construction, provides for installation of sections to any desired length for any cfm requirement. The "Far-Air" filters used in the eliminators are designed to assure low pressure loss and high air handling and grease holding capacity.



Above: Filter Adapter



Right: Diffuser

Ceiling Diffuser

TYPE P "AEROFUSE" ceiling diffusers consisting of five diffuser types for specific air delivery requirements — Tuttle & Bailey, Inc., Corbin Ave., New Britain, Conn. Type PA is an adjustable, multi-passage diffuser in which the air distribution pattern may be varied from horizontal to vertical. It is intended for spot cooling or spot heating, for high ceiling applications, etc. The center cup of the diffuser is turned to adjust the pattern.

.... the **BEST BUY** for—
INCREASED ATTENTION
and
LASTING SALES POWER

THE JANUARY 1954 ISSUE
and 22nd Annual Directory Number of
AMERICAN ARTISAN

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CONTENT**

January AA will be a "regular issue" in every respect. It will carry a full quota of timely articles—the same as in every issue of this field-leading book. For extra attention value, it will have heavy covers, and be specially mailed.

Here's a regular issue, and a directory issue, combined in one great January number . . . and *no advance* over regular issue rates!

Here your advertising will get *increased attention*, and have *lasting sales power* (as product reference copy) throughout all of 1954.

Here is the "best buy" of the year in our field . . . the place where a convincing sales story of your complete facilities will do you untold good.

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— gives heating comfort unequalled by any other method!

Here, Mr. Heating Contractor, is your BIG sales opportunity for 1953. When you sell and install the Thermo-Base System, you are selling both health and comfort. Quote Thermo-Base on every job and watch your sales and profits grow!

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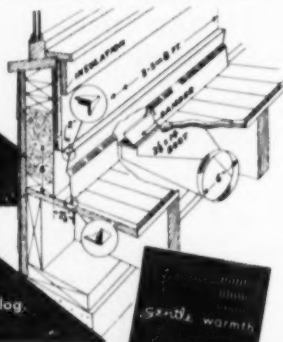
these features that make your selling job easier!

- ✓ **INSTALL AROUND OUTSIDE WALLS**
... gives gentle warmth from ceiling to floor. Exclusive design eliminates drafts, hot spots and frigid fringes. Allows complete freedom for furniture arranging.
- ✓ **3 CONVENIENT LENGTHS**
Eight, five and three foot lengths are accurately rated for all static pressures and air temperatures. Units are finished in grey prime coat. Easily blended to any decorating scheme.
- ✓ **HEALTHFUL HEAT**
The Thermo-Base System gives equal distribution of humidified and filtered air. Draperies and walls stay clean longer.
- ✓ **AIR CONDITIONING**
Perfect air distribution makes Thermo-Base the ideal system for summer cooling.

Here is one of many ways that Thermo-Base may be economically installed in either NEW or OLD CONSTRUCTION.

SEND TODAY! for this new, comprehensive eight page catalog.

**THERMO-BASE DIVISION
GERWIN INDUSTRIES, INC.
MICHIGAN CITY, INDIANA**

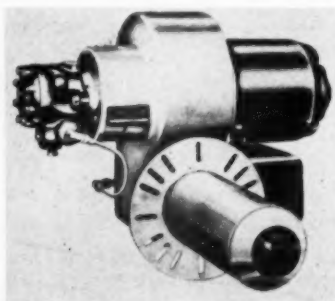
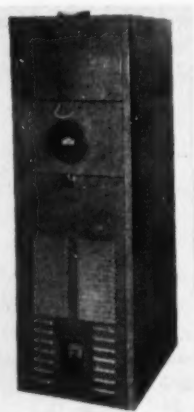


equipment developments . . .

Other diffusers in the line include the Type PS stepped-down type, fixed pattern; Type PF flush type, with fixed pattern; Type PR flush type, with fixed pattern supply and return; and Type PH flush type, with a fixed pattern and half round diffuser. In all types and sizes there are matching facial contours and the identical number of rings to assure uniform appearance if more than one type is called for in an area.

Counterflow Furnace

MODEL DF-AC counterflow furnace for perimeter heating installations, designed for compactness and quiet operation — H. C. Little Burner Co., Inc., Woodland Ave. and Du Bois St., San Rafael, Calif. The furnace is 24 in. wide, 30 $\frac{3}{4}$ in. deep, and 74 in. high. The inspection panel is removed for access to the burner and controls, and an additional panel at the top exposes the 10 in. blower. The smoke pipe outlet is at the top of the unit. The return air intake at the top of the unit can be straight down or can come in at either side or the back. The unit is rated at 92,000 Btu per hr output and is UL listed for zero clearance at the back and both sides.



Above: Oil Burner

Left: Furnace

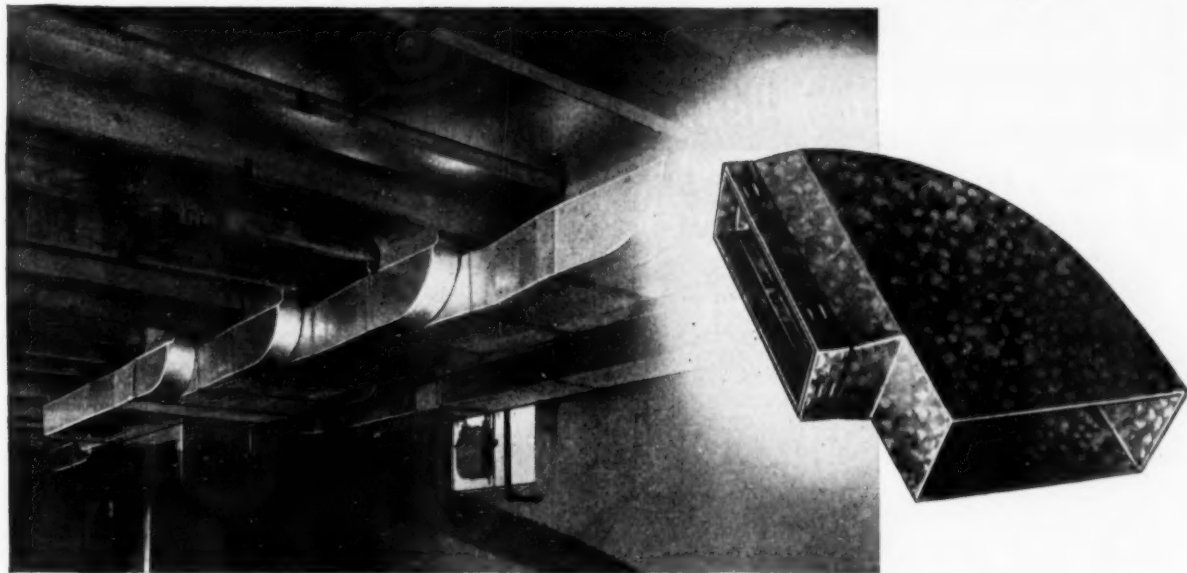
Flange Mounted Oil Burner

MODEL 400 AF flange mounted oil burner designed to keep pulsation at a minimum — The Carlin Co., River Rd., Wethersfield, Conn. It is also available in the pedestal mounted model for 4 in. adjustment for standard type of installation. A specially designed air deflector baffle, adjustable in the field, is intended to insure thorough mixing of air and oil at all times and to provide positive positioning of the fire from the end of the air cone.

Roll Forming Machine

THREE NEW FEATURES added, as standard equipment, on the Series C all-steel 5 in. rolls — Wysong and Miles, Co., 625 Fulton St., Greensboro, N. C. A single hand-wheel on the front of the machine is intended to give fast, parallel adjustment of the rear roll. Indicator scales are clearly visible from the front of the machine, the company states. A safety treadle now extends the full

✓ Check this **DIFFERENCE** in *Lamneck* Furnace Pipe & Fittings...



Installation by Hazelton Heating Company, Muncie, Indiana

Snap-Tite Connectors

for easier, quicker, better installations



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Hazelton Heating Company

HERE are more reasons why C & L Lamneck is preferred by leading warm air heating contractors: Less air resistance; less air leakage; material and labor savings up to 30%; easier job figuring; made from uniform non-peeling galvanized steel. These and other important reasons make it worth your while to investigate C & L Lamneck. Write for free catalog, or name of your nearest wholesaler to Clayton & Lambert Mfg. Co., 1701 Dixie Highway, Louisville, Ky.

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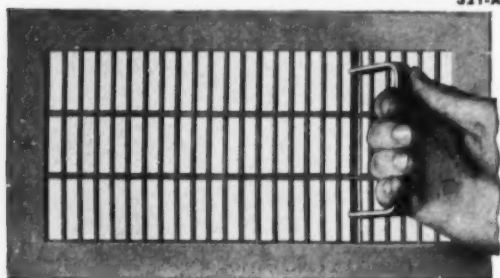


INDEPENDENT

"Fabrikated" WALL GRILLES
for Commercial Installations

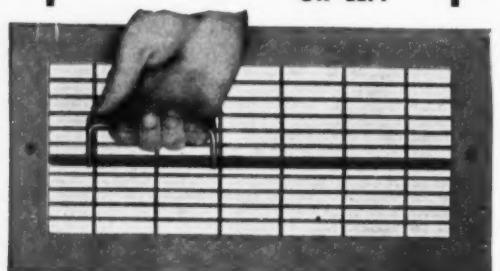
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DIRECTED AIR FLOW

321-A



UP OR
DOWN

RIGHT
OR LEFT



311-A

Made to fit openings in even
inches from 8" x 4" to 60" x 40"



Independent Fabrikated* Adjustable Grilles (patented), rigidly constructed with stamped steel rims and steel bars, are made with either vertical or horizontal grille bars. Grille bars are *adjustable* before or after installation; available also with bars permanently set for straight flow.

Write for new Catalog No. 52—gives schedule of sizes, details and prices.

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*Reg. U. S. Pat. Off.

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equipment developments . . .

length of the front of the machine. Depressing the treadle from any position breaks the electrical circuit and stops the machine, which can be reactivated at a push button station. In addition, the top roll raises automatically with the lowering of the drop-end, a single lever providing the means for releasing the drop-end for lowering. On raising, the drop-end automatically locks into position.

Oil Fired Furnace

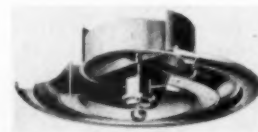
SERIES 533 oil fired winter air conditioner for installations with above average heating requirements — Thatcher Furnace Co., Centre St., Garwood, N.J. It is available in three sizes: 210,000, 250,000, and 330,000 Btu at register. Design features include a slip-joint casing with rounded corners; a cylindrical inner casing; and a large filtering area. Increased heat transfer is provided by an oversized radiator with welded seams for permanent tightness, the company states. The blower can be placed on the right or left side of the heating element.

Automatic Deburring Tool

"NOBURMATIC" AUTOMATIC deburring tool for simultaneous deburring and chamfering of front and back faces of holes in sheet metal, plate, extrusions, castings, and forgings — Nobur Mfg. Co., 717 N. Victory Blvd., Burbank, Calif. It is designed to produce uniform quality deburring with consistent accuracy, and is suited for use in portable drill motors or stationary machine tools such as drill presses. The tool deburs the front face of the metal during the entry of the tool in the hole. The rear side is deburred during the withdrawal cycle. Independent controls are provided for setting the working depth of front and rear cutters. Two models are offered, one for non-ferrous metals and other soft materials, the other for ferrous metals and relatively tough materials. Standard models are available in individual tool sizes corresponding to drill gages from 1/8 in. in diameter to "F" (0.257).



Deburring Tool



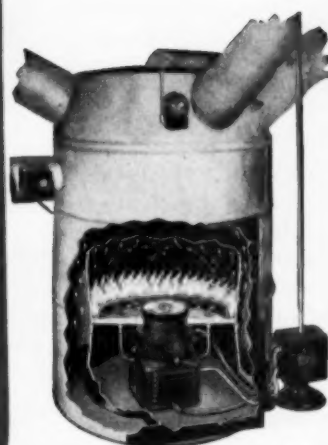
Diffuser

Thermostat-Controlled Air Diffuser

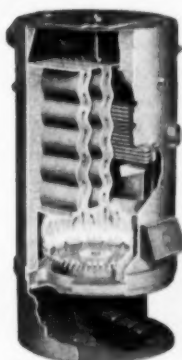
"KNO-DRAFT" ceiling diffuser in which air volume is modulated by a damper which is operated by a pneumatic motor remotely controlled by a thermostat — W. B. Connor Engineering Corp., Shelter Rock Lane, Danbury, Conn. It is designed for air conditioning systems serving zones having variable heat loads, such as areas subject to changing sun effect, fluctuating occupancy, etc. The sleeve damper moves up and down without enlarging or constricting the neck area, meaning that

Easy to Sell!
Easy to Install!
Easy to Service!

TORIDHEET



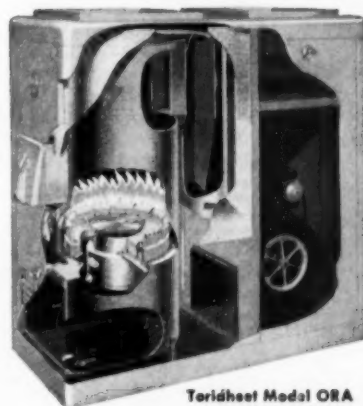
Toridheet Model F in warm air furnace



Toridheet Model ORU
rotary fired boiler



Toridheet Model
ORA-75 Hi-Boy
winter air conditioner



Toridheet Model ORA
winter air conditioner

The Pioneer rotary wall flame oil burner

The customer-proved economy of TORIDHEET rotary wall flame equipment makes it your best bet for sales and satisfaction. TORIDHEET equipment sells easily and *stays sold*.

- Economical — saves up to 50% on oil
- Burns catalytic oil efficiently
- Quiet and clean
- Correct flame placement
- Fully automatic
- Trouble-free — one moving part
- Backed by 30 years of research and development

... For conversion jobs and in complete heating plants

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 AUTOMATIC HEATING

TORIDHEET DIVISION
 CLEVELAND STEEL PRODUCTS CORPORATION

Affiliated Canadian Manufacturers: Conroy Mfg. Company, Ltd., Catharino St., St. Catharines, Ont.

equipment developments . . .

regardless of the damper position, performance of the diffuser is unaffected, the company states. Air quantity alone is changed, not air pattern or effective area of diffusion.

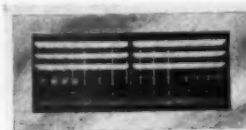
Heating Unit

MODEL PH-2 "Porta-Heat" oil fired heater which may be used for space heating, spot heating of materials, etc., and for fan cooling in summer — Auburn Burner Co., Auburn, Ind. Heat output is 120,000 Btu per hr, blower capacity is 1000 cfm, oil firing rate is 0.35 gph. It is mounted on rubber tired wheels. No chimney is required for venting. Dimensions are 19 in. wide, 20½ in. deep, 57½ in. high.

Winter Air Conditioner

MODEL U-AC oil fired upright winter air conditioning furnace designed to combine high heat output with compact design and easy serviceability — H. C. Little Burner Co., Inc., Woodland Ave. & Du Bois St., San Rafael, Calif. Turning the handle removes the front panel, giving access to the burner, fan and limit control, transformer, oil valve, and junction box. The flame is visible when a 4 in. cast-iron plate is swung open. The 10 in. blower is located on runners. The unit measures 27½ in. wide, 30 in. deep and 60 in. high. The top

heat discharge opening is 24 x 24 in. The unit is rated at 82,000 Btu per hr output, and is UL-listed for 1 in. clearance on sides and back.



Above: Register

Left: Winter Air Conditioner

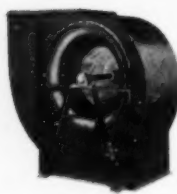
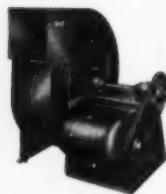
Register

"AIRFOIL" REGISTER No. 277, combining a four-way directional grille with opposed blade dampers — Titus Mfg. Corp., 113 E. 8th St., Waterloo, Ia. This design is intended to provide for maximum directional control and positive volume control. Frames are heavy gage cold-rolled steel, in one piece. The front louvers are individually adjusted and the damper blades in the rear are key-operated.

NO FINER LINE-UP FOR PLANT CLEAN-UP



ELECTRONIC AIR CLEANING—New Westinghouse PRECIPITRON® Oil Mist Control unit efficiently collects coolant mists generated during machining operations. Send for Catalog TC-1400.

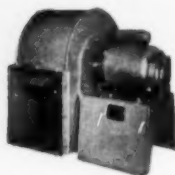


INDUSTRIAL FANS—An efficient new General Purpose Fan, requiring smaller motors, is available on short delivery. Three wheel types for fumes, gases, metallic dusts, chips, shavings, or long stringy materials. Four arrangements for integral or separate motor drive, belt or direct-connected. Send for Catalog 1150.



CAST IRON VOLUME FANS—Sturdy fans designed for severe industrial exhausting applications or furnishing air blast. Noted for trouble-free low-cost service under toughest conditions. Send for Catalog 1130.

For data on the full Westinghouse line, ask for General Catalog 600, or call your local Westinghouse-Sturtevant office.



UTILITY SETS—Low-cost V-belt and direct driven models available from stock. Sturdy, quiet centrifugal fans, easy to install for air supply, ventilation and fume exhaust. Send for Catalog TC-1160.

YOU CAN BE SURE...IF IT'S

Westinghouse

AIR HANDLING

Westinghouse Electric Corporation
Sturtevant Division
Hyde Park, Boston 36, Massachusetts

Please send me a free copy of General Catalog 600.

Name

Company

Title

Address

City Zone State

Top Quality
NATIONAL LOCK
 Hardware
 makes a good product better

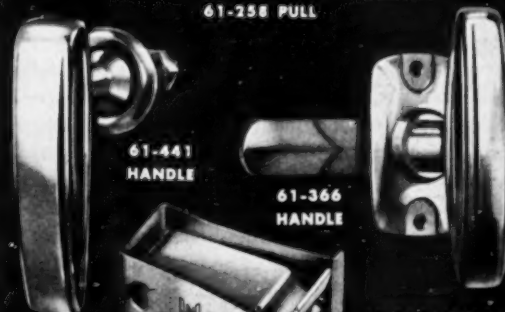
Ask About It For Use On
 air conditioning equipment . . .
 stokers . . . gas heating units . . .
 oil burners . . . humidifiers . . .
 space heating units



61-284 PULL



61-258 PULL



61-441
HANDLE

61-366
HANDLE



61-095A CATCH



61-340 CATCH



THREAD-CUTTING
SEMS



61-095C STRIKE



KEPS
PRE-ASSEMBLED NUT and LOCK WASHER

write for complete information
NATIONAL LOCK COMPANY
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AVERAGES 10% LESS
 IN
OPERATING
COST

The same design features that make the standard Lo-BLAST famous for efficiency are now available in this residential size burner.



LO-BLAST
ECONOMITE
 THE "MIGHTY MITE"

OF CONVERSION GAS BURNERS

Nothing like it on the market! Here, indeed, is an *utterly different and better* gas burner. Consider these features: Power burner design assures perfect combustion, regardless of natural draft conditions—a proved fuel saver—safe and efficient for down-draft heating plants. The Economite burns so smoothly you can't tell when it's running—no "pop" when the burner goes on and off.

Every Economite is factory-tested on gas and shipped assembled—fully equipped with fool-proof safetys. Simplicity of design and durable construction reduce service to a minimum. Capacities of 70,000 to 500,000 BTU give thorough coverage of the residential field.

DEALERS! You can make real money on the exclusive sales features of the Lo-BLAST Power Gas Conversion Burner. Get the facts—write today.



The Standard Lo-BLAST for larger installations. Capacities up to 20,000,000 BTU input.

MID-CONTINENT
METAL PRODUCTS CO.

1960 N. Clybourn Ave., Chicago 14, Ill.

Don't take ANY brand of SOLDER

Here are the reasons WHY!

There is a theory that a man who specializes in mousetraps will build better mousetraps than the one who makes merely wood or metal products. This is the narrow view of the self-conscious specialist.

Others say, "Specialists are those who know more and more about less and less," which invites the conclusion that the greatest specialist of all must be he who knows everything about nothing.

Federated believes that the hundreds of products of non-ferrous origin have a basic family resemblance, and that the more we know about all, the more we know about each. Thus lead is found with silver and antimony, and copper and tin are found with iron. These various elements and others must be separated and refined, or in some cases, discarded. Then, re-combined in different ways, sometimes alone, sometimes with other non-ferrous ingredients, they make brass, bronze and aluminum ingot; solders and type metals; die casting alloys, lead products and bearing metals; anodes for plating and for cathodic protection.

Federated's competent organization of scientists and technicians, its widespread field force of servicemen, and its network of qualified distributors are unified under the central policy of producing quality products and making these products most useful to every customer from the smallest to the largest.

We count it an advantage to you, and to the jobber from whom you buy, that Federated's organization is big enough to specialize in quality control and service from the depths of the mine to the user's shop. It is one of the reasons that Federated is known as "Headquarters for Non-ferrous Metals."

Federated Metals Division

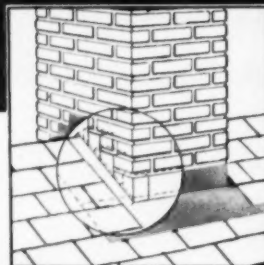
AMERICAN SMELTING AND REFINING COMPANY
120 BROADWAY, NEW YORK 5, N. Y.

In Canada: Federated Metals Canada, Ltd., Toronto, Montreal

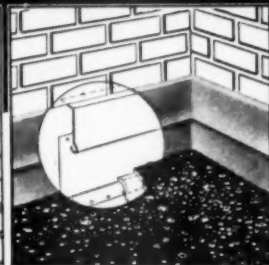
Aluminum and Magnesium • Babbitts • Brasses and Bronzes • Anodes
Die Casting Metals • Lead and Lead Products • Solders • Type Metals



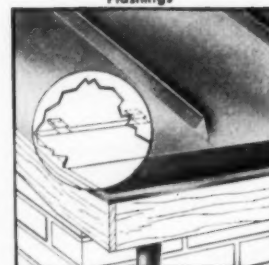
For **EASY PROFITS** **WEATHERSEAL** with **FOLLANSBEE TERNE METAL**



Step Chimney
Flashings



Wall or Parapet
Flashings



Built-in Gutters

Every house needs weathersealing and every flashing, coping, valley or gutter is another opportunity for you to make a larger profit by installing Follansbee Seamless Terne Metal.

And weathersealing with Follansbee Terne Metal is *so easy*, too. Its ductility makes it easy to shape and bend. Already primed, the tin and lead coating makes it easier to solder . . . can never flake or peel . . . comes in 50-foot continuous rolls without cross seams. Can be cut to any desired length. No need to provide for expansion joints, either!

Industrial and commercial buildings need weathersealing, too. When you make your regular check-up on roof maintenance contracts be sure to show samples of Follansbee Terne Metal to architects and engineers. Tell them about trouble-free Follansbee Terne Roofs in service fifty years or more. That's the direct route to "easy profits" in weathersealing and roofing contracts.

**Carried nationally by all leading
sheet metal distributors**

*Removal of government manufacturing regulations means
Follansbee Terne is made better than ever now!*

FOLLANSBEE STEEL CORPORATION

GENERAL OFFICES, PITTSBURGH 30, PA.

Cold Rolled Strip

Seamless Terne Roll Roofing

Polished Blue Sheets and Coils

Sales Offices—Chicago, Cleveland, Detroit, Indianapolis, Kansas City, Los Angeles, Milwaukee, Nashville, New York, Philadelphia, Rochester, San Francisco, Seattle; Toronto and Montreal, Canada. Mills—Follansbee, W. Va.

FOLLANSBEE METAL WAREHOUSES

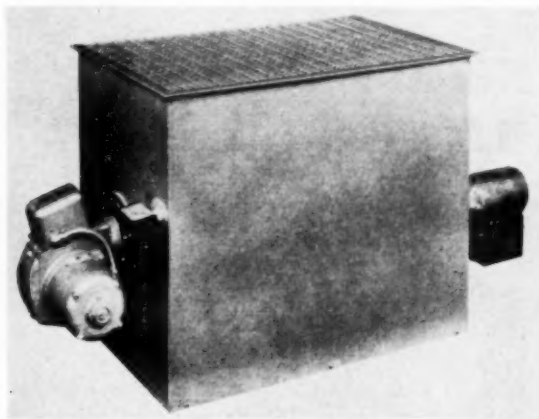
Pittsburgh, Pa. Rochester, N. Y. Fairfield, Conn.



equipment developments . . .

Floor Furnace

FLOOR FURNACE, for basementless buildings utilizing forced air circulation — Quiet Automatic Oil Burner Corp., 33 Bloomfield Ave., Newark, N. J. A



small hole 30 in. deep under the floor is required for installation. Where regulations permit, no chimney is needed. A small vent pipe, with induced fan, may be used. Capacity is 80,000 Btu.

Baseboard Register

IMPROVED BASEBOARD register with a removable front, slotted openings, and an optional spring-loaded balancing damper — Thermo-Base Div., Gerwin Industries, Inc., 214 Spring St., Michigan City, Ind. Units are available in 8, 5, and 3 ft lengths, and each size is accurately rated for all static pressures and air temperatures, the company states. The units are installed along outside walls and under windows. They are adaptable for old or new construction.

Water Conditioning Products

THREE NEW "Vapco" water conditioning products designed to help maintain the efficiency of water cooling equipment in air conditioning systems — The Garman Co., Inc., 9555 Breuer St., St. Louis 23. "Preventive" solution is designed to keep condensers clean after they are treated by the other two products. It inactivates the solids usually found in water and holds them in solution, to be drained off naturally once each month. It also contains chemicals to inhibit slime and algae growth and to prevent corrosion. "Slimex" is for use as a "shock" treatment to kill slime bacteria and algae growth. "Cleaner" is an acid type salt designed to remove scale and other incrustants which may have accumulated on equipment through lack of proper water treatment.

Oil-Fired Unit Heater

MODEL UH220 unit heater, fired with a conventional gun type oil burner — Delta Heating Corp., 1 Cole St.,

NEW

here's what you've been looking for...

more profits with this International

Economy

horizontal furnace

Oil and gas models available in space saving designs with wide installation flexibility

Call your International Economy distributor today . . . there's EXTRA profits for you in these new horizontal furnaces which can be installed almost anywhere — basement, utility room, attic, even crawl space under home! It's tomorrow's furnace for your sales today.

- Shipped factory-assembled
- Oil sizes — 25,000, 112,000, 168,000 Btu output
- Gas sizes — AGA Input — rating of 60,000, 80,000, 100,000 Btu's
- Alternate filter positions
- Beautiful smooth-enamelled cabinets



International Heater Company

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Western Warehouse — Chicago, Illinois

111 years of heating experience at your service



Shown here is the smallest size, Model OS-80E. These oil units carry our famous TEN-YEAR WARRANTY on heating element and casing!

Automatic Humidifiers

A COMPLETE
LINE WITH
A TYPE AND
SIZE FOR
EVERY
WARM AIR
FURNACE



THERMO-DRIP
Gives furnace owners the most efficient, most dependable way to put moisture in the air. New airtight valve doesn't lime up.

VAPORITE 555
Completely assembled for lowest cost installation. Positive thermostat control feeds water to vapor pan in proportion to heat. Gives proper balance of moisture.

VAPORITE 500
Quick heat transfer stainless steel pan available in sizes tailored to fit most applications. Makes most efficient evaporating surface and long life service.

NEW VAPORITE 577
New pre-assembled model for straight or sloping bonnet. Extra ridged mounting adjusts simply for any bonnet angle. Absolute minimum installation time.

MODEL CF500
FOR COUNTER FLO FURNACES
Makes healthful humidified warm air available in homes with perimeter systems. Requires no pan. Takes no space. Bottom of plenum chamber in concrete floor is evaporating surface. Write today for free literature.
A-93

AUTOMATIC HUMIDIFIER CO.
CEDAR FALLS, IOWA

equipment developments . . .

Trenton 8, N. J. The vertical flue travel permits the products of combustion to be exhausted into the air through a short flue pipe. The burner and flue outlet can be attached to either side of the heater. Hanging hooks are provided for ceiling suspension. The louvers in the front of the unit are adjustable to vary the direction of



heated air. Heat output is 220,000 Btu per hr when fired with a 2 gph nozzle. The $\frac{1}{2}$ hp propeller fan and motor will "throw" heated air for an effective length of 150 ft, the company states. Air delivery is 5730 cfm. The unit weighs 390 lb, with burner and controls. It is 49 $\frac{1}{2}$ in. high, 39 in. wide, 21 in. deep.

EQUIPMENT BRIEFS

IMPROVED "SUPER SLUGGER" electric hammer employing neoprene blocks to give more impact to each of the blows — Tempo Products Co., 2075 E. 65th St., Cleveland 3. Because of the resiliency of the blocks, the normal $\frac{5}{8}$ in. piston travel is increased to 1 $\frac{1}{4}$ in. at full speed, the company states.

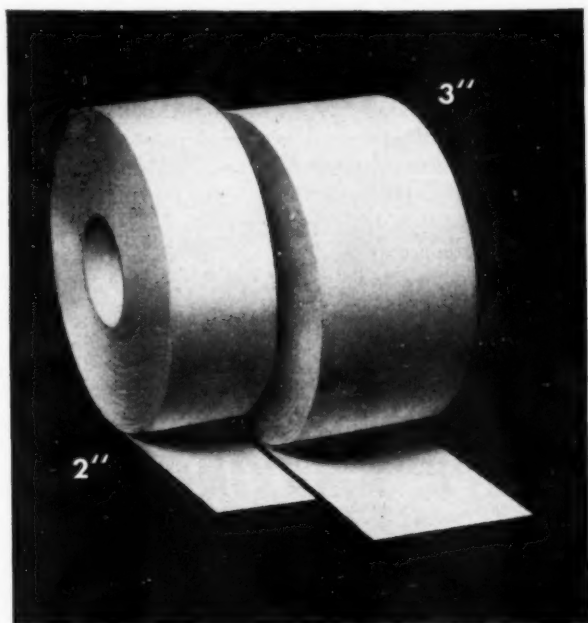
"COPPER LINE" electric drill kit containing a $\frac{1}{4}$ in. drill and 19 accessories for drilling, buffing, polishing, grinding, and wire brushing — Thor Power Tool Co., 20 S. Lake St., Aurora, Ill. The drill features pistol grip operation and has a trigger lock pin for continuous operation.

SELENIUM RECTIFIER welder with wide current ranges for welding metal of a variety of thicknesses — Miller Electric Mfg. Co., 718 S. Bounds St., Appleton, Wis. Current ranges for the different models are: 3 to 300 amp, 3 to 400 amp, 5 to 525 amp, and 125 to 750 amp.

RANGEFINDER for measuring steep roofs — Meyer-Opticraft, Inc., 39 W. 60th St., New York 23. It is a precision finder with a 6 in. base length for measuring distances of from 8 to 100 ft.

TYPE 420-A sound analyser for use in measuring noise intensity in blowers and other equipment — Hermon Hosmer Scott, Inc., 385 Putnam Ave., Cambridge 39. It separates noise, sound and vibration signals into their component parts.

Put a
FINE FINISH
on your work with
***Sal-Mo* ASBESTOS
PIPE JOINT TAPE**



The superior tensile strength of this popular material assures a neat, clean-looking job—with no wrinkling or rough edges.

Put up now in the brand-new carton shown below—12 rolls of 3-inch tape (1,008 ft.) or 18 rolls of 2-inch tape (1,512 ft.).

Order
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your
wholesaler
TODAY!
Be sure to
specify **SAL-MO.**

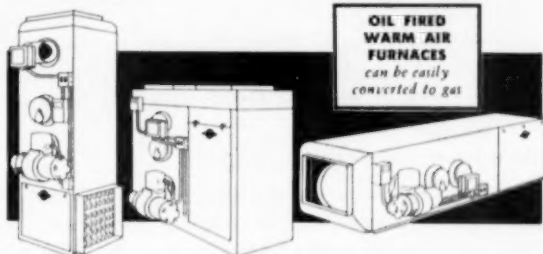


THE SALL MOUNTAIN COMPANY
HAMILTON, OHIO

**YOU ALSO GET THE
BIG SIZES
in the BESSER line!**

A COMPLETE RANGE OF SIZES . . .
from 75,000 BTU to 500,000 BTU

A COMPLETE LINE OF MODELS . . .
*Horizontal • Vertical • Basement
Downflo • HiBoy • LoBoy • Suspended*



**OIL FIRED
WARM AIR
FURNACES**
*can be easily
converted to gas*

***Plus* SPECIAL ORDER SERVICE**
on any size unit UP TO 1,000,000 BTU

For jobs that require units larger than 100,000 B.T.U., Besser offers fast, reliable Special Order Service. We have the facilities to build any type unit required, up to 1,000,000 B.T.U. output. Every "special order" is built to the same high standards of the regular Besser line. Whatever your need, we can build it!

***And now!* A NEW PROFIT-MAKER
JOINS THE BESSER LINE**
Revolutionary

**HORIZONTAL Summer
AIR CONDITIONERS**

for Residential or Commercial installations

Combining space-saving "horizontal" design with an entirely new cooling principle, Besser Summer Air Conditioners bring central air conditioning within the reach of almost everyone. Designed for installation and operation in conjunction with central heating systems, units are fully adaptable to either warm air or hot water heating. Greatly increased efficiency lowers initial and operating costs through use of smaller units.

Available in 2, 3 and 5-Ton units.

"Only the BEST goes into a BESSER!"

BESSER WARM AIR FURNACES
Summer AIR CONDITIONERS
The Complete Line for Year-Round Profits

BESSER METAL PRODUCTS CORP., P. O. BOX 4064, CHARLOTTE, N. C.

new literature . . .

Gas Fired Furnaces

BOOKLET gives details on "Gasaver" forced air and gravity furnaces in capacities ranging from 63,750 to 176,000 maximum Btu output — Williamson Heater Co., 3529 Madison Rd., Cincinnati 9. The units feature a modulated type fuel input automatically varied by an outdoor thermostat. Heat produced by the furnace is delivered by a two-speed blower.

Registers, Grilles and Accessories

CATALOG No. 53 (72 pages) gives data and prices on registers and grilles for residential and commercial applications — United States Register Co., 324 E. Burnham St., Battle Creek, Mich. Included are single and multiple valve registers, ceiling outlets, diffuser base, floor and sidewall registers, furnace faces and dampers.

Aluminum Roll-Formed Shapes

BROCHURE describes the production of aluminum continuous roll-formed shapes, including storm sash sections, awnings and trailer bodies — Reynolds Aluminum Fabricating Service, 2001 S. Ninth St., Louisville 1. The process makes available a wide variety of cross-sectional shapes rolled from flat or coiled strips in any length required. Also described in the booklet are

facilities for blanking, bending, shearing, drawing, welding and finishing other parts produced by the fabricating service.

Powder-Actuated Fastening Tools

APPLICATION MANUAL (30 pages) illustrates fastening jobs involving steel, concrete and other materials where power-actuated tools and fasteners may be used — Ramset Div., Olin Industries, Inc., 12117 Berea Rd., Cleveland 11. Specifications on fixtures and accessories, drive pins and threaded studs are listed. Selection tables show the proper type fastener and proper powder charge for various receiving materials. The handbook is available through the company's dealers and field representatives.

Portable Electric Power Tools

A 40 PAGE catalog (39-A) illustrates, describes, and gives specifications and prices on electric tools, including drills, grinders, hammers, saws, nibblers, impact wrenches, and others — Thor Power Tool Co., 175 N. State St., Aurora, Ill. The accessories and attachments available are also shown.

Fiber Glass Insulation for Metal Buildings

FOLDER describes a blanket form fiber glass insulation for metal buildings — Fiber Glass Div., Libbey-Owens-

Low Cost

... WITH AMAZING PERFORMANCE FAR BEYOND AVERAGE DEMANDS

- HEAVY STEEL BODY
WELDED CABINET
- FOUR SECTION
PREHEAT CHAMBER
- AIR FILTER
EXPANDED
FIBRE 20" x 25"
- 1/2 H.P. MOTOR
WITH VARIABLE
SPEED PULLEY
- 12" WHEEL
BLOWER
- RETURN AIR INLET
14 1/2" x 16 1/2"
- WARM AIR OUTLET
16 1/2" x 22"
- GUN TYPE
BURNER
- STAINLESS STEEL
COMBUSTION CHAMBER
- BAKED METALESANT
CABINET FINISH



HACKER

CABINET OIL BURNING FURNACE

● Here's a quality furnace that will do two very important things for you.
FIRST... it will keep your bids low. Give you contracts. Make you good profits against tightest competition.
SECOND... it will give years of trouble free performance and stop costly call-backs.

Shipped completely assembled. . . .
 Write for FREE ENGINEERING DATA.

— FREE DATA —

Standard Heating Equipment Company
 Waterloo, Iowa

Gentlemen: Rush me complete money saving facts on the new Hacker oil-burning furnace.

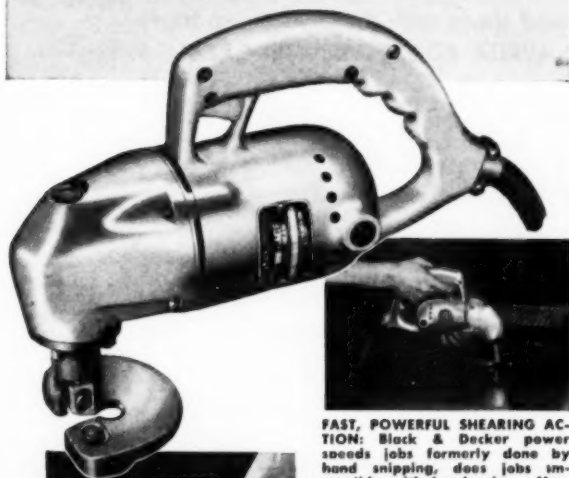
NAME _____
 ADDRESS _____
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MAIL
COUPON
TODAY!

Throw away your snips!

Switch to Black & Decker Electric PORTO-SHEARS*

for faster, easier, more accurate cutting!



CUTTING OPERATION ALWAYS VISIBLE: Follow straight lines, irregular patterns and curves down to small radius easily with Porto Shears. Visible operation keeps rejects to a minimum.



FAST, POWERFUL SHEARING ACTION: Black & Decker power shears jobs formerly done by hand snipping, does jobs impossible with hand snips. Muscular strain is a thing of the past!



CUTS MANY MATERIALS: steel, galvanized iron, Monel, stainless, copper, aluminum, lead, and other non-ferrous metals. Adaptable to thin sheets of laminated wood or sheet plastics.

Once you've used a B&D Electric Porto-Shear, you'll never want to go back to slow, tedious hand snips. B&D Porto-Shears cut sheet metal too tough for snips! They speed up jobs where snips are slow . . . save time and cut costs on hundreds of jobs. . . eliminate muscular strain. Like all B&D tools, Porto-Shears are made with husky housings, top-quality parts. Two models, in capacities for 16-gage and 12-gage steel. See your nearby Black & Decker Distributor for demonstrations of these and other famous B&D Tools. Write for free catalog to: THE BLACK & DECKER MFG. CO., 640 Pennsylvania Ave., Towson 4, Md.

*Trade Mark Reg. U. S. Pat Off.

LEADING DISTRIBUTORS EVERYWHERE SELL



Black & Decker

PORTABLE ELECTRIC TOOLS

DRILLS

SANDERS

BENCH GRINDERS

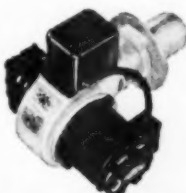
HAMMERS

AMERICAN ARTISAN, SEPTEMBER 1953

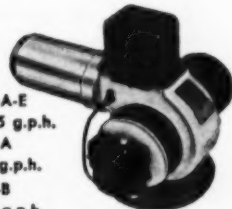
for BETTER PERFORMANCE



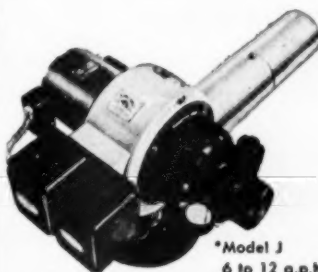
FAMOUS THE WORLD OVER
FOR QUALITY AND ECONOMY



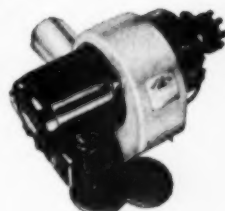
Flanged Models
for all require-
ments.



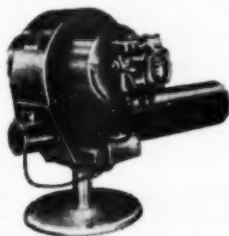
Model 1C-A-E
0.5 to 1.35 g.p.h.
Model 1C-A
0.75 to 2 g.p.h.
Model 1C-B
1.5 to 3.5 g.p.h.
*Model 1C-6
3 to 6.5 g.p.h.



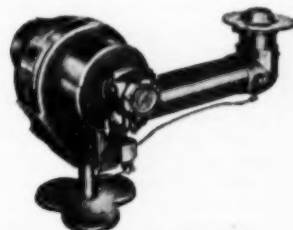
*Model J
6 to 12 g.p.h.
*Model K
10 to 25 g.p.h.



Model G
0.75 to 2.5 g.p.h.
Model H
2 to 6 g.p.h.
Model H-2
5 to 8 g.p.h.



*Series "5" Burners with special aerodynamically designed housing for famous fuel saving "Shell" Combustion Head. Model S-0.7 to 2 g.p.h. Model S-1 -2 to 3 g.p.h. Model S-2 -3 to 6 g.p.h.



*Model VS (Vertical Flame), with special aerodynamically designed housing for famous fuel saving "Shell" Combustion Head; 0.7 to 2 g.p.h. Model VS-1, 2 to 3 g.p.h.

*Delayed action oil valve mounted and wired. Available on other models as an extra.

Built-in electronic controls optional on all models.

Inquiries invited from boiler
and furnace manufacturers

SUN-RAY BURNER MFG. CORP.

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Jamaica 2, New York

185

The finest Elbows on the market carry this

TRADE *F. Dieckmann* MARK

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The line is complete and the prices are right. Dieckmann makes elbows for every angle and of every standard size, style and metal. Plain round, corrugated round and square styles A and B. Hot-dipped galvanized after formation.

Your jobber carries Dieckmann elbows and shoes with the Dieckmann trade-mark to guarantee quality and service. **WRITE FOR COMPLETE CATALOG.**



THE FERDINAND DIECKMANN COMPANY

1300 HARRISON AVENUE

CINCINNATI 22, OHIO

**THIS AMAZING NEW BETT-MARR
outperforms sheet metal saws
costing six times as much**

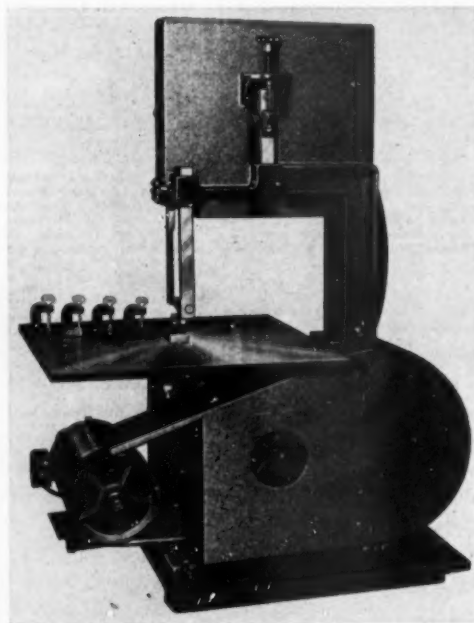
For faster, smoother, more accurate cutting of galvanized sheet metal, there's nothing better than a Bett-Marr—yet, it actually costs so little, no shop can afford to be without one.

The all-cast frame of the new, improved Model 14 SM assures the utmost in stability and accuracy and reduces vibration to a minimum.

CUTS 50 to 70 STACKED SHEETS—of galvanized sheet metal up to 15 inches per minute. An all purpose 14 inch bandsaw with lifetime sealed precision bearings.

SMOOTH, POWERFUL CHAIN DRIVE—Blade speeds from 125 to 2200 FPM quickly adjustable for metals, plastics, wood, castings or forgings.

POSITIVE BLADE CONTROL—Case hardened guides with carbon back-up bearing (adjustable up to 1/2" blade width) assure accuracy. Flanged wheels control blade for perfect radius and straight line cuts.



☐ Please send me more information on the Bett-Marr sheet metal saw

☐ Where can I buy a Bett-Marr

Name

Address

City Zone State

Shown above
MODEL 14 SM*

Depth of Cut 8 1/4"
Blade to Frame 13 1/2"
Table Size 20x22
Overall Depth 34"
Blade Length 97"

*Includes set of 4 sheet metal clamps and riser bar insert to match for sheet metal work.

MAIL COUPON TODAY . . . GET THE AMAZING FACTS

Learn how you can cut production costs with a Bett-Marr sheet metal saw. It pays for itself quickly in both large and small shops. (Equipment dealers—write for information on available territories.)

new literature . . .

Ford Glass Co., Toledo 3. Three standard methods for applying the insulation are illustrated. Blankets are available in widths of 18, 24, 36, 48 and 72 in., and in lengths up to 300 ft.

Metal Saws

AN ILLUSTRATED pocket size booklet (28 pages) tells how to cut metals with hand and power hack saws and band saws — Clemson Bros., Inc., Middletown, N. Y. Included are rules for selecting and using hack saw blades and frames, an explanation of the number code for power blades, cutting recommendations for ferrous and non-ferrous metals, a price list and specifications.

Furnaces and Air Conditioners

FURNACES and air conditioning units are described in catalog 1124-1 (12 pages) — The Waterman-Waterbury Co., 1121 Jackson St., N. E., Minneapolis. Specification tables are given for all units.

Welding Stainless Steels

THE WELDING and metallurgical aspects of stainless steels are described in Bulletin GET-1955 (8 pages) — General Electric Co., 1 River Rd., Schenectady 5, N. Y. The booklet discusses applications for all three classifications of stainless steels — martensitic, ferritic, and austenitic.

Pressure Atomizing Burners

A 16 PAGE catalog covers oil, gas and combination gas-oil domestic pressure atomizing burners — Ray Oil Burner Co., 1301 San Jose Ave., San Francisco 12. Specifications and capacity tables are included.

Thermometers

BULLETIN E-2 (16 pages) features mercury-in-glass and bimetallic thermometers — Precision Thermometer & Instrument Co., 1434 Brandywine St., Philadelphia 30. Included is a complete listing of thermometers for installation in ducts. A new addition to the line of bimetal-actuated dial thermometers is a "straight" or bottom-connected thermometer.

Coating for Alloy Steels

FOLDER describes a coating process designed to protect alloy steels exposed to high temperatures — Solar Aircraft Co., 2200 Pacific Highway, San Diego 12. The process, consisting of a series of ceramic coatings, was originally developed for aircraft engine purposes.

Air Handling Units

BULLETIN I600 (six pages) describes the features of a line of air handling units for ventilating applications — Westinghouse Electric Corp., Sturtevant Div., 200 Readville St., Hyde Park, Boston 36.

NOW! A Truly effective

HUMIDIFIER

USING A CENTRIFUGAL ATOMIZER

— for WARM AIR FURNACES!

The new *Walton* MODEL WF

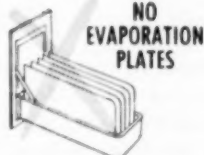


Only WALTON provides —
**Automatic, Trouble-Free
Operation with Positive
Moisture Output**



NO JETS
OR
SPLASH
PANS

NO PANS



NO
EVAPORATION
PLATES

Evaporating capacity is better than 3 gallons of water per day. Water vapor is produced by means of a centrifugal mechanical atomizer which eliminates the use of jets, splash plates, evaporation plates or other troublesome parts. This new Walton Model WF can be connected to humidistat control for complete automatic operation. Adaptable to all warm air duct systems.

Consistent with our policy of maintaining the highest standards for quality and performance, this model is manufactured of only the finest grades of non-ferrous materials and using exclusive Walton patents.

Only WALTON offers —

Real Humidification for any Type of Heating System

Write today for information on Walton portable room models and literature on the Model WF, the first truly effective humidifier for warm air furnaces.

WALTON LABORATORIES

INCORPORATED

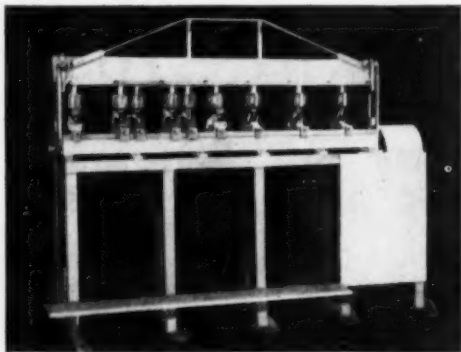
IRVINGTON 11, NEW JERSEY

Chicago Branch Office, 30 No. LaSalle Street

FALLSINGTON

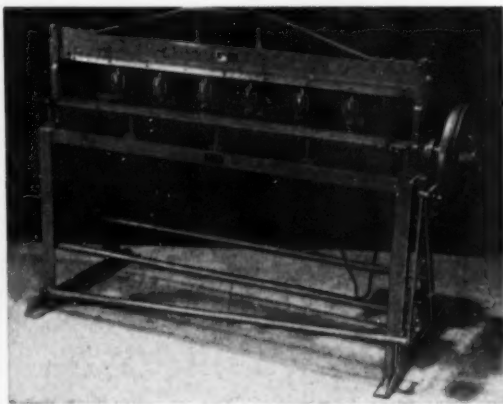
LET FALLSINGTON SOLVE YOUR NOTCHING AND PUNCHING PROBLEMS

We can solve your notching and punching problems with two great machines — the Fallsington "C" Multi-Punching Machine and the A & B Multi-Notcher.



Above the Fallsington "C" Multi-Punching Machine is suitable for aluminum window rail and all types of multiple punching and notching. Dies are movable for entire length of machine and are self contained.

Length of machine, 3 to 6 feet.



Above — the famous Fallsington Multi-Notcher — Power driven. Made in four sizes to accommodate sheets from 18" to 48" in width — ideal for making fittings for duct work, etc.

We also manufacture—Rolling machines—Benders & crimpers—Pipe Lock Bumping machines—and a line of hand tools—clip punch—drive cleat notchers and omni shears.

**FALLSINGTON MANUFACTURING CO.
FALLSINGTON, PA.**

**Manufacturers
SHEET METAL MACHINERY & TOOLS**

new literature . . .

Summer Cooling

VARIOUS methods of keeping the home cool in summer, such as ventilation, insulation, air conditioning, and the use of sun controls (overhangs, trees, blinds, awnings, etc.), are discussed in circular G6.0 — Small Homes Council, Mumford House, University of Illinois, Urbana. Air conditioning using the ductwork of an existing warm air system is described. Room air conditioners, heat pumps and evaporative coolers are also covered. Price of the booklet is 10 cents.

Perimeter Diffusers

CIRCULAR describes "Two-in-One" perimeter diffusers designed to handle both heated and cooled air — Titus, Inc., 1304 Broadway, Waterloo, Ia. Line drawings illustrate the advantages claimed for the unit which include uniform temperatures, draft-free operation, and low installation cost.

Effect of Bronze Wash on Marble

THE FINDINGS of an investigation to determine whether rain water flowing over bronze work and then over marble causes deterioration of the marble are presented in Building Materials and Structures Report 137, *Influence of the Wash from Bronze on the Weathering of Marble* — Superintendent of Documents, U. S. Government Printing Office, Washington 25. (Price, 15 cents.) It was found that some marbles are not appreciably injured by such conditions, while others gave evidence of advanced stages of disintegration within a period of 30 years.

Packaged Chimneys

PACKAGED MASONRY chimneys are described in circular AIA No. 5-H — Van-Packer Corp., 209 S. LaSalle St., Chicago 4. Included are drawings of typical installations, engineering data, and a five-step installation procedure.

Pan Formers and Electric Seamers for Roofing

TWO NEW MACHINES — a pan former and an electric seamer — designed to reduce the time and labor required for installing terne roofs are described in Volume 3, No. 2 of *Terne Topics* — Follansbee Steel Corp., 3rd and Liberty Ave., Pittsburgh 30. A four page insert uses line drawings to describe methods of constructing and installing valleys and gutters of terne metal.

Ventilating Fans

ENGINEERING, installation and operating data for standard and special duty fan applications is given in a 64 page fan engineering manual (Catalog No. 20) — Aerovent Fan Co., Inc., 720 E. Ash St., Piqua, Ohio. Details are included for calculating duct sizes, friction losses, performance and hp requirements.



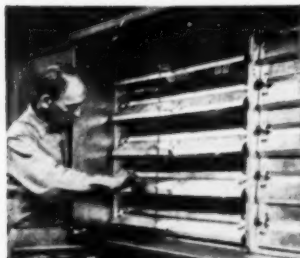
Johnson & Johnson's
new SHIPPING CENTER in RARITAN TOWNSHIP, N. J.
calls for the maximum in efficiency and trouble-free Multi-
blade Damper operation. All the 60 Damper units installed
by the Hutchinson Ventilation Co., were assembled with
"Duro-Blade-Kit," Precision-Engineered, Damper Hardware.

Says: Edward Kleinberg, Gen. Supt.
HUTCHINSON VENTILATION CO.
WHITE PLAINS, N. Y.

"We save valuable assembly time
in the shop and are assured of
greater efficiency and smoother
operating Multi-blade Damper units
by using



"DURO BLADE KIT" PRECISION-ENGINEERED DAMPER HARDWARE



Damper being inspected at the
Hutchinson shop. Self-centering
feature of "Duro Bracket" saves
many costly hours of assembly
time.



Damper model shows
how either parallel
or opposed blade
action is accom-
plished.

- Greatly reduces assembly time.
- Produces highest quality Damper known.
- Automatic, self-centering DURO BRACKET assures smooth, non-binding operation.
- Self oiling DURO BUSHING "tap-fit" into Frame.
- Can be used on heaviest Dampers.
- Corrosion-resistant materials.
- Fits 3 in. blade or wider.
- Can be screwed, bolted, riveted, welded or spot-welded.

**WRITE for Free Demonstration Kit and illus-
trated Manual on how to SAVE on Damper units.**

DURO-DYNE CORPORATION Dept. B
38 SOUTH FRANKLIN STREET, HEMPSTEAD, L. I., N. Y.



SMALL... WALKER Junior Fuel Saver Automatic Draft Regulators come in four types—engineered for use with space heaters, circulators, water heaters, trailer stoves and all other heating equipment within that range.



There's a **WALKER** Fuel Saver **AUTOMATIC DRAFT REGULATOR** for Every Heating Application



LARGE... The Ball Bearing Type WALKER Industrial Fuel Saver is available in 16" to 48" sizes for applications in schools, office buildings, apartments, stores and manufacturing plants.



AND IN BETWEEN

There are two types of WALKER Domestic Fuel Savers to meet draft control requirements of central heating plants in homes, apartments, and multiple housing projects.



Only WALKER Makes a Complete Range of Sizes of Automatic DRAFT REGULATORS



WALKER
Automatic
DRAFT REGULATORS

• Whether for trailer stoves or for industrial boilers serving the nation's largest housing project—the right Walker Fuel-Saver Automatic Draft Regulator can be selected from stock. Twelve Million sales...thousands of successful applications throughout the range of heating...speak for themselves...give proof of Walker design, craftsmanship and engineering. You can be sure that there is a Walker Fuel-Saver ready for any application you may have.

SEND FOR CATALOG



Twenty pages show all types, sizes in full line. Applications and installations described. A valuable handbook FREE, if you write...

CHECK THESE 9 POINTS

- 1 **EASE OF ADJUSTMENT** with exclusive patented pointer and calibrated dial.
- 2 **BOX TYPE HINGES** with sealed protection against corrosion, dirt and dust.
- 3 **BALANCE PLATE**—scientifically designed to maintain proper balance.
- 4 **SPECIFIC PIPE SIZES**—insure correct capacity for every type of installation.
- 5 **ALUMINUM FRAME**—rigid, long lasting.
- 6 **EASE OF INSTALLATION**—collar and stub for quick attachment.
- 7 **ARMCO ALUMINIZED STEEL**—for heat and corrosion resistance.
- 8 **FACTORY SET**—for "performance as perfect as possible."
- 9 **FREE FLOW** of air in unrestricted inside area.



NEW WALKER VENTURI-TOP CHIMNEY CAP

is winning approval on more and more installations. Proved to be ideal in design and construction to correct insufficient draft and stop down draft...and to solve ventilating problems. Sizes from 3" to 8" ready for immediate delivery.

WALKER MANUFACTURING & SALES CORP.
1730 PENN. ST. ST. JOSEPH, MO.



"Most Valuable"

**in
PRODUCING
SALES**

Sundstrand
All Electric
OIL BURNER

Such integral values as design, construction and performance give the Sundstrand line selling power backed by consumer acceptance.

The public hears about Sundstrand. They see Sundstrand. They buy Sundstrand.

Because: Ultimate heating satisfaction means having an oil burner with

- ★ DURABILITY
- ★ DEPENDABILITY
- ★ COMPACT DESIGN
- ★ OVERALL ECONOMY
- ★ QUIET OPERATION

These salient features result from 32 years of engineering and development by Sundstrand. Available is a complete line of oil burners for new installations or conversion. To increase *your* sales with Sundstrand,

write to —

SUNDSTRAND ENGINEERING CO.
ROCKFORD, ILLINOIS

new literature . . .

Heat Pumps

AN ILLUSTRATED booklet, designed for architects, describes how heat pumps can fit into a variety of architectural plans — General Electric Co., Heat Pump Dept., 5 Lawrence St., Bloomfield, N. J. Application hints are given along with answers to questions most commonly asked about the unit.

Fasteners

DIMENSIONAL and engineering data to aid in the selection of fasteners for specific applications is presented in a 22 x 26½ in. product chart — Huck Mfg. Co., 2480 Bellevue Ave., Detroit 7. Typical information provided is fastener material, head types, and strength of blind rivets, collars, and other fasteners.

Air Cooled Condensers

APPLICATION MANUAL U-250 (22 pages) gives engineering data for the "Unicon" remote type air cooled condenser — Kramer Trenton Co., N. Olden & Breunig Ave., Trenton 5, N. J. Information is included on selection, indoor and outdoor installation, mounting, piping, etc. Residential models are available in 3, 5 and 7½ ton sizes. Price of the manual is \$1.25.

Making Stampings in Small Lots

A 24 PAGE brochure describes a technique for making die-cut stampings in small lots — Dayton Rogers Mfg. Co., 2830-13th Ave., S., Minneapolis 7. Stampings up to an overall size of 22 x 22 in., in various gages and materials can be blanked, pierced and formed under this process.

Insulation Fastening

STEEL STRAPPING for fastening insulation is covered in a four page circular — Acme Steel Co., 2840 Archer Ave., Chicago 8. Size, weight and type of steel strapping are shown in table form. Line drawings illustrate models of stretchers and sealers available. Features of each model are given, and types are recommended for specific jobs.

Attic Fans

STANDARD and "deluxe" models of horizontal and vertical attic fans are described in an illustrated catalog — Murray Co. of Texas, Inc., 3200 Canton St., Dallas 1. Each type of fan is presented on a separate sheet which tabulates complete specifications. A special section illustrates step-by-step installation instructions.

Plastic Terrace and Porch Roofs

AN ILLUSTRATED four page folder describes how to build translucent, fiber glass-reinforced, plastic coverings for terraces, patios, porches, breezeways or carports — The Resolite Corp., Zelenople, Pa. Instructions are given on how to put up the shelter framework and how to install the covering sheets. Diagrammed fastener and flashing details are also included.

LOOKING FOR WALL BASE HEATING FOR WARM AIR FURNACES?

GET BRANDES!

Sell Brandes — the wall base heating that's designed for forced warm air systems. It's easy to install — spreads heat evenly to blanket the entire wall — low in cost! Let us give you complete facts and figures — write today!

BRANDES COMPANY

2046 Winnebago

MADISON 4,

WISCONSIN



- ★ BIGGER PROFIT
- ★ EASY INSTALLATION
- ★ LOW COST

*The First, and Patented

MAXITROL
does many things
much better

**IN THE FIELD OF GAS
PRESSURE REGULATING**

MAXITROL

—first in perfecting high capacity gas pressure regulators with the now-famous "Straight-Through" principle . . .
—first in the development of a modern appliance regulator incorporating a non-metallic seat . . .
—first in imaginative engineering for creative product development . . .
MAXITROL pledges continued advancement in the gas pressure regulator field—your guarantee of greater efficiency for your product at lower cost!



MAXITROL

COMPANY

formerly
DETROIT REGULATOR CO.

12200 BEECH ROAD

• DETROIT 28, MICHIGAN

Sold on the Pacific Coast by: PACIFIC SCIENTIFIC CO.
San Francisco, Los Angeles, Seattle, Portland

Tomorrow, as yesterday, you may look to
MAXITROL for engineering and
product leadership

we hear that . . .



CARL J. WINKLER, Herman E. Winkler, and Claude A. Potts (l. to r.) test the 100,000th "Winkler" oil burner to come off the assembly line

THE 100,000th "Winkler" oil burner recently came off the assembly line at the Lebanon, Ind., plant of U. S. Machine Div., Stewart-Warner Corp. Three executives attached the serial number to the unit — a low pressure type — and put it through a series of firing tests.

A. O. SMITH CORP. salesmen are carrying portable displays which make it possible for them to demonstrate the working of temperature controls for heating systems.

The display is lighted from within and depicts a living room scene, below which is a furnace with cold air return and warm air pipes.

H. F. BRUNDAGE, president, The Brundage Co., was recently elected president of the Kalamazoo school board.

GENERAL ELECTRIC CO. plans to build a manufacturing plant at Jonesboro, Ark., which will employ approximately 300 people. The new plant will be part of the company's specialty fractional horsepower motor department and will manufacture small blower and fan motors for air conditioners.

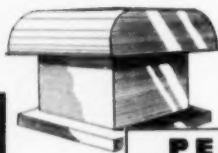
The company's control department has developed a show on oil burner controls for presentation to heating dealers, contractors, and service men throughout the country. The show, which opened in Springfield, Mass., on July 28, is scheduled to make more than 150 stops over a year-long period.

New name of the company's heat pump is "Weathertron". The name was chosen from 6000 entries submitted by approximately 4000 employees.

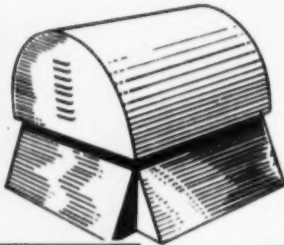
The home heating and cooling department has developed a template designed to simplify layout of home heating and cooling equipment on architectural plans. It can be used for locating G-E home heating and cooling equipment on plans and also as a guide for locating "Air-Wall" system registers.

PENN VENTILATORS

Perform Efficiently . . . Economically!



**PENN
AIRETTE**



**Penn
DYNAFAN**

There is a type, size and capacity for all your ventilating requirements. Efficient and economical Penn Ventilators are easily installed and last long, providing years of trouble-free, inexpensive ventilation. They have been removing dust, vapors, smoke, heat, fumes and odors from public, commercial and industrial buildings for more than a quarter of a century.

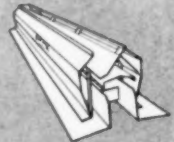
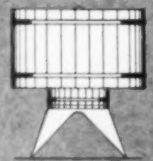
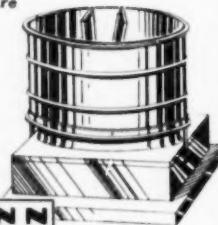
Write for descriptive literature on the entire line or send us your specific problems for qualified recommendations.

Manufacturers of:
Propeller Fan—Centrifugal Fan, Stationary, Rotary and Ridge Roof Ventilators and accessory products. Representatives and distributors in principal cities.



**penn
POWER**

**PENN
HI-EX**



PENN VENTILATOR CO.

Main Office and Factory
North Goodman St. & Allegheny Ave.
Philadelphia 40, Pa.

FOR MORE THAN 25 YEARS THE BUILDERS' ^{AT} TOP LINE!

Cut Installation Costs! One hammer blow permanently rivets



STANDARD
E-Z-ON
DAMPER
REGULATOR

E-Z-ON

E-Z-ON Damper Controls are easily, quickly installed to save you time and money. E-Z-ONS lower initial cost offers you additional savings and extra profits. Start saving money now. . . . Call your jobber today!

LEADING JOBBERS STOCK "EZ-ONS"

In Canada — THERMIDAIRE CORP. LTD. Toronto

M. A. GERETT CORP.

724 WEST WINNEBAGO STREET, MILWAUKEE 5, WISCONSIN

"CORRECT PRACTICE in OIL HEATING"

NOW AVAILABLE TO YOU!

A complete reprint of the valuable series

by J. J. Mirabile

This practical series covers every angle of oil burner work, including arrangement of shop . . . stocking of parts . . . record-keeping . . . installation procedures . . . the handling of crews . . . how to make heating surveys . . . how to size combustion chamber . . . how to install thermostat . . . how to start the burner . . . how to use testing instruments . . . and how to operate a service department. It contains, as well, a complete list of causes and cures of oil burner troubles that will serve as a reliable guide in making service calls.

Every shop handling oil burner jobs should own this book. Full size, 8½ by 11 inches — 57 pages of practical helps. Send \$1.00 for a copy today to the address below.

KEENEY PUBLISHING COMPANY

6 No. Michigan Avenue

Chicago 2, Ill.

3 ways to MODERNIZE oil burner installations

install VENTALARM® Whistling Tank Signal Fill

Here's the way to provide for modern, automatic oil delivery. Guarantees accurate, no-spill fills day or night, whether customer is at home or away.

"Just Fill While the Whistle Blows"

A variety of
models for
new and old tanks.



install SCULLY® GAUGE

Underwriters' Approved

A modern convenience in every way. Big figures readable at first glance. Face adjustable to any angle. Built for accurate, service-free operation. Specify tank depth when ordering.



"BUTTON-LIFT" INSTALLATION

Lifting the button indicator draws cork arm up close to main shaft for easy installation even in partly filled tanks.



or install this combination . . .

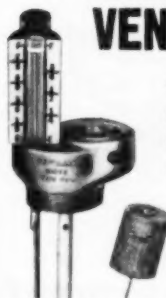
VENTALARM® GAUGE

Underwriters' Approved

The famous whistling fill signal and easy reading gauge in one modern unit. Goes on tank as integral part of vent pipe.

Specify tank depth and opening when ordering.

One item to install instead of three . . . with button-lift convenience described above.



Scully Products are manufactured under U.S. and foreign patents or patents pending.

See your regular Supply House.

SCULLY SIGNAL COMPANY

First Street, Cambridge 41, Mass.

Canadian Licensee: EMPIRE BRASS MFG. CO., LTD., London, Ontario
©1953 Scully Signal Co.



we hear that . . .



DEALERS from Pennsylvania, New Jersey and Delaware arrive at Wichita to attend the heating and air conditioning course co-sponsored by the Coleman Co. and the University of Wichita

MORE THAN 1000 dealers received certificates from the University of Wichita for completing a special home heating and air conditioning course sponsored by the Coleman Co. in cooperation with the university's College of Adult Education.

The company is using three radio shows for its fall selling campaign which began on September 15. The shows will run over a four week period.

GUNNISON HOMES, INC., housing subsidiary of United States Steel Corp., has changed its name to United States Steel Homes, Inc. The company has started production of factory-made steel buildings at its plant in Harrisburg, Pa.

THE NEW NAME of the Erwin E. Scharer Metal Products Co., Kalamazoo, Mich., is Wolf Sheet Metal Co. The change went into effect on August 1.

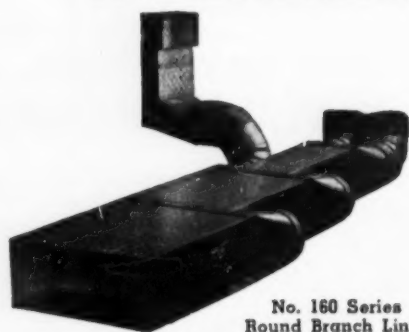
A PLASTIC DISPLAY piece showing the operation of "Regulaire" blowers is being offered to its dealers by Perfection Stove Co. The display is suitable for window or counter use, or it may be placed on top of furnaces in showrooms.

A 16MM SOUND movie, *Resistance Welding of Stainless Steel*, is available on a loan basis from Allegheny Ludlum Steel Corp. Running time is 22 minutes.

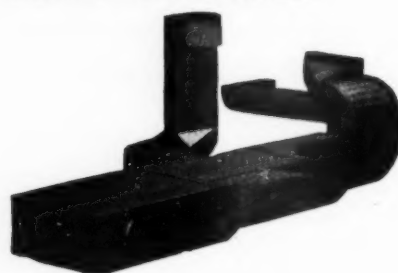
JONES & LAUGHLIN STEEL CORP. recently opened a new warehouse at 1898 Herron Dr., Nashville, Tenn. Lou R. Webb is resident manager.

SERVEL, INC., in cooperation with the Arkansas-Louisiana Gas Co., is installing 2 ton air conditioning units in the first 104 homes in the Broadmoor housing development at Little Rock. There will be a total of 700 houses in the development, all of which will be air conditioned. The

GRAY "Snap-Rite" FURNACE PIPE AND FITTINGS AIR CONDITIONING PIPE AND FITTINGS



No. 160 Series
Round Branch Lines



No. 170 Series
All Square Lines

A complete line of Gravity and Forced Air Pipe and Fittings with our positive "SNAP-RITE" Lock for quick assembly and erection. Wall Stack and Fittings in 3 1/4" standard depths. Truck Pipe and Fittings in 8" standard depths.

Write for Catalog

GRAY METAL PRODUCTS, INC.

30 Carlton Street

Rochester 7, New York

The REX AIR-PAK BLOWER-FILTER

*Pays off in
New Profits—New Customers!*



Here's a quick and easy way to make new friends and new profits—an ideal way to transform scores of gravity furnaces into modern winter air-conditioners.

The REX AIR-PAK BLOWER-FILTER forces clean filtered air, at even temperatures, into hard-to-heat rooms in winter and provides cooling ventilation for summer. Regardless of type of fuel—the Rex Air-Pak will show substantial savings—up to 25% in fuel bills.

Packaged for easy installation—cushioned on resilient rubber for quiet operation—housed in a sturdy, compact, baked-enamel cabinet—the Rex Air-Pak is designed for long, trouble-free satisfaction. A full range of sizes makes it simple for you to service any hot-air heating job.

For complete details—write today to

AIR CONTROLS, INC.

Division of the Cleveland Heater Co.

2310 SUPERIOR AVENUE • CLEVELAND, OHIO

With all the promotion on the
Majestic Gas-Fired Incinerator

*Don't Forget
The Sales-Proved*

Majestic
**FUELLESS
INCINERATOR**

Does All
The Job —

Costs Only
Half As
Much!



*Thousands Have Been Sold!
Thousands of Satisfied Users!
Thousands Can Still Be Sold!*

Every housewife is quick to see that this handy appliance saves steps, time, and trouble. The Majestic Fuelless Incinerator gets rid of wastebasket trash plus *wet and dry* garbage by burning it all *indoors*. Waste itself serves as fuel. Unique downdraft does the trick! Dries the refuse and hastens complete burning. *Guaranteed*. Taps to furnace flue in basement or utility room. Tips more profits your way.

Write Today For Details

The Majestic Co., Inc.

110-A Erie St., Huntington, Ind.

"We sell Janitrol because—

We had such splendid service and performance from our own Janitrol Unit Heater installations"

Statement by Mr. A. J. Keinath, Manager, Heating & Plumbing Dept., Morley Brothers, Saginaw, Michigan.



One of the original Janitrol Unit Heaters installed 14 years ago, still in use with practically no servicing or maintenance.

Recent Janitrol addition in the Morley Brothers Floor Covering Department.



It was from their own experience as a satisfied user of Janitrol equipment that lead Morley Brothers into becoming an enthusiastic seller of Janitrol.

No testimonial could offer a finer tribute to Janitrol's durable performance than this transition to sales.

You should be vitally interested in the dependability of the equipment you handle.

First, nothing robs you of profits as fast as frequent call backs and extra service.

And, you must depend on satisfied customers for future success.

Write today for particulars of Janitrol's merchandising policy.

Janitrol

Automatic Heating

SURFACE COMBUSTION CORPORATION
TOLEDO, OHIO

we hear that . . .

houses are brick veneer, ranch style models, ranging in price from \$10,995 to \$17,000.

R. S. SCHMIEDER has retired from Inland Steel Products Co. where he has been general sales manager since 1945. Mr. Schmieder is well known in the sheet metal fabricating industry and has frequently been called upon to speak at sheet metal conventions.



R. S. Schmieder

THE R. L. SPITZLEY Heating Co. held open house on August 12 in celebration of 35 years in the heating business.

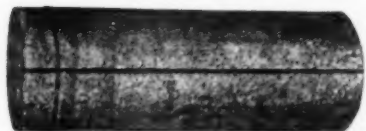
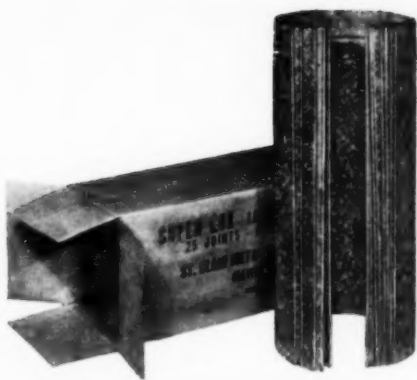
THE LENNOX FURNACE Co. is offering to its dealers an outline for conducting an "old furnace" contest. The winner — the owner of the oldest furnace in the community — receives a completely installed heating system. One contest conducted by the Comfort Heating Co., Fort Wayne, Ind., produced 263 prospects, 74 of whom purchased new heating systems.

HEAT EXCHANGER promotional material being sent to dealers by Morrison Steel Products, Inc., includes a 20 x 28 in. display card, a color photo showing a suggested arrangement for a display room, a guarantee form, postcard reminders, and personal letters.

MINNEAPOLIS-HONEYWELL Regulator Co. is planning to produce packaged control systems that will provide automatic control of various industrial process operations. Each unit will be specially engineered for a specific process operation, and will include recording and controlling instruments, measuring and control elements and related accessories. The units will be developed only for those industrial processes where there is little need for variation in the control system elements.

E. I. DU PONT de Nemours and Co., Inc., plans a \$2 million expansion program at two plants manufacturing "Freon" fluorinated hydrocarbon compounds. Major part of the new manufacturing facilities will be located at the Chambers Works at Deepwater Point, N. J. Additional facilities are also being constructed at East Chicago, Ind.

REVERE COPPER AND BRASS, INC., has formed an aluminum general sales department to parallel its copper and brass general sales department. Headquarters of the new department will be at 230 Park Ave., New York. Stanley H. Wilson is sales manager.



Stock up *NOW* with...

SUPER-LOK

finest quality Galvanized SNAP LOCK
PIPE and FITTINGS

Packed in CARTONS for your convenience, Super-Lok is your greatest value in furnace pipe and fittings! It locks easier, quicker...holds tighter...provides dependable, long-lasting service for all types of installations—gravity, forced air, air conditioning! Standard gauges and sizes. Order Super-Lok now and be ready for the big demand!

NEW! PACKAGED for easy handling!
GALVANIZED FERRULES FOR GUTTERS

Packed in handy cartons of fifty. Eliminates hand counting. Finest quality galvanized steel ferrules, in 4", 5" and 6" sizes. Order today!

St. Clair METAL PRODUCTS CO.

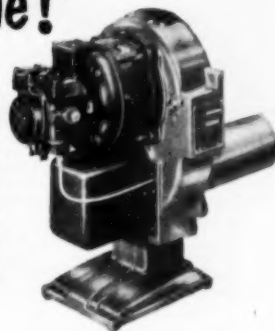
6700 Central Avenue • Cleveland 4, Ohio • Henderson 1-5678

MAKERS OF NATIONALLY-FAMOUS SUPER-SHEEN CHROME PIPE AND FITTINGS

"Old rocking chair's got me!"



Today, **ROCKING CHAIR COMFORT** has become the by-word of service men who know Beckett **COMMODORE** oil burners. Engineering foresight eliminates inconvenient and tedious adjustments. Note the time saving features below.



FOUR LIVE RUBBER CUSHION MOUNTINGS
CARRY POWER UNIT IN SUSPENSION



HERMETICALLY SEALED STARTING SWITCH



(SPRING CONTACTS)

Cushioned-Power
Minimum Adjustments
Compact Symmetrical Design

The Power-Unit is removable as a single unit from the rear.

NOTE: The Power Unit (comprises all moving parts) suspended in rubber prevents metal to metal contact and sound transmission.

Sealed Starting Switch at top of motor...Simplifies service. Remove only one screw for access to motor switch...not necessary to remove motor or Fuel Unit.

Convenient access to nozzle-electrode assembly...No ignition cable. Spring contacts automatically make connection when transformer is closed.

ALL VITAL PARTS ACCESSIBLE FROM BACK OF BURNER

BECKETT
Commodore
OIL BURNERS

R. W. BECKETT CORPORATION, ELYRIA, OHIO

we hear that . . .



REPRESENTATIVES from all parts of the United States attended the recent annual sales meeting held by Norge Heat Div., Borg-Warner Corp.

NORGE HEAT DIV., Borg-Warner Corp., recently held its annual sales meeting in the Civic Auditorium, Kalamazoo, Mich. Panel discussions and slide talks were featured. Present at the meeting were 17 new field salesmen.

RIGHTS to the manufacture and sales of Heatwell gas conversion burners, formerly manufactured by the Maxwell Corp., have been acquired by Hastings Air Conditioning Co.

A VISUAL ATOMIZATION demonstrator is proving to be an effective sales tool for dealers handling Williams Oil-O-

Matic oil burners. The unit consists of two transparent closed chambers with a low pressure burner firing into one chamber and a high pressure burner firing into the other. The units are sold to dealers.

A NEW SERIES of traveling shows has been designed by Penn Controls, Inc., to demonstrate the function and operation of heating and refrigeration controls. Heating control shows are scheduled to appear in the following cities: Cincinnati, September 17; Evansville, Ind., September 21; St. Louis, September 24; Memphis, September 28; Jackson, Miss., October 1; New Orleans, October 5; Mobile, October 8; Montgomery, October 12; Birmingham, October 15; Atlanta, October 19; Chattanooga, October 22; Nashville, October 26; Knoxville, Tenn., October 29; Louisville, November 2; Dayton, November 5; Columbus, November 16; and Fort Wayne, November 19.

Refrigeration control shows are scheduled as follows: Cincinnati, September 18; Evansville, Ind., September 22; St. Louis, September 25; Memphis, September 29; Jackson, Miss., October 2; New Orleans, October 6; Mobile, October 9; Montgomery, October 13; Birmingham, October 16; Atlanta, October 20; Chattanooga, October 23; Nashville, October 27; Knoxville, October 30; Louisville, November 3; Dayton, November 6; Columbus, November 17; and Fort Wayne, November 20.

It's the **LOW DOWN** DIRT trapped by **WILSON'S HAIR FILTERS** that **GUARANTEES LONGER LIFE**

In Wilson Hair Filters the entire dust-holding capacity is completely utilized. This means, *no surface dust stopping only*, but Full-Depth Dust Trapping at its best . . . and many extra months of filter life.

The reasons are so simple:

1. The hair media in Wilson Hair Filters act in the same manner as Mother Nature's proven way of filtering the air you breathe. It's the *hair* that cleans the air . . . more easily, more effectively, more economically.
2. The multi-directional distribution of the hair in Wilson Hair Filters literally invites all dust and dirt to come in and be trapped throughout the entire filter interior.
3. Most brands of air filters require oiling on their inlet surfaces. This stops dust prematurely, loads up the incoming air side and materially shortens filter life.

Wilson Hair Filters are not oiled on the inlet side. Instead, they receive an even distribution of mineral oil on their outlet surface, which:

- (a) augments the already amazing ability of the hair itself, to catch and hold dust, and—
- (b) builds an impregnable barrier which halts dust and dirt after reaching the furthestmost practicable penetration point.

WILSON & CO., INC.

(Air Filter Division) 4100 South Ashland Ave., Chicago 9, Ill.

Wilson Hair Filters are another quality product of Wilson & Co., world-famous for meat products, sports equipment, pharmaceuticals, hair products, etc.

The famous Edgesel,
the original Hair Filter
with the patented self-
sealing edge.



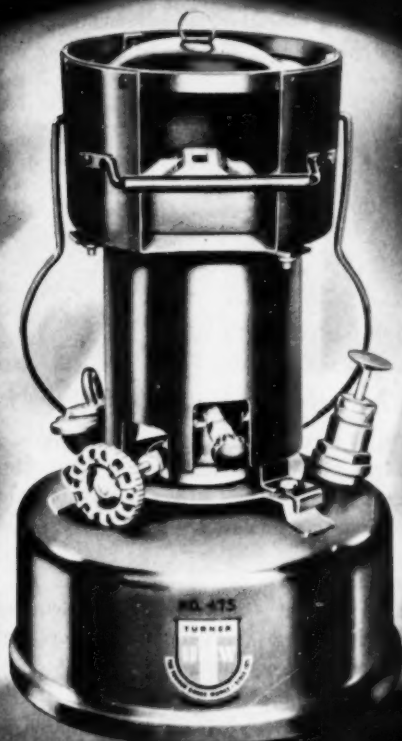
The popular Honey-
comb, the dressed up
Hair Filter that is so easy
to handle.

Save delay. Save dollars. Save doubt. Send for FREE sample with details and prices.



TURNER

Quality Since 1871



No. 475 Low Pressure TINNER'S FIRE POT

● Smokeless...sparkless...sootless! Complete with Turner's exclusive "Carburetor Control" for more perfect combustion; also a flame control — for exact heat desired — which automatically cleans the orifice. Construction assembly permits quick, easy accessibility...windshield, top-plate, and bail handle are one unit, and can be lifted from tank by loosening one wing nut. Burner coil is made of extra-heavy seamless steel tubing, protected by sturdy outer jacket that maintains heat without overheating; can be generated and used in heavy wind. Fuel capacity — one gallon; burns for 9 hours on one filling. Get details, too, on Turner's popular Plumber's Fire Pot (No. 275); also Turner's complete line of Blow Torches.



See
Your
Jobber

THE TURNER BRASS WORKS

SYCAMORE ILLINOIS

Since 1871

CUSTOM BUILT— QUANTITY PRICED

atlas BOILER JACKETS

YES, Atlas combines highest quality with lower costs by using basic styles and eliminating tooling costs. You can get boiler jackets custom built to your specifications from ATLAS at prices that will surprise you. ATLAS offers three flush type boiler jacket styles to meet manufacturers' demands. All are of heavy gauge steel, with baked enamel finish, ready for quick installation. You'll find them all the last word in appearance and value.



ECONOMY

Square type construction is featured in this model. In spite of its fine appearance Economy is competitive in price. Ideal for large scale housing projects where price is a major factor.



QUALITY

The richness of the round-cornered top is combined with the simplicity and economy of the square-cornered body. This style is competitive in price with all standard construction designs.



DELUXE

This fully round-cornered design is Deluxe in every way. The full radius on all corners lends massiveness and beauty to its expensive appearance. Use Deluxe for your select dealer trade at surprisingly low cost.

Atlas also manufactures cabinets for heating, cooling and air conditioning units, and furnace cabinets of any style. We will be glad to quote cost estimates on any type of boiler jacket or cabinet on receipt of your specifications and requirements.

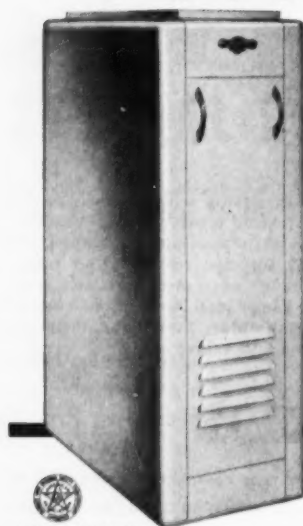
Atlas MANUFACTURING COMPANY

EUSTIS AT ROBBINS ST. • ST. PAUL 4, MINN.

ROBERTS-GORDON

PRESENT their FINEST ACHIEVEMENT . . .
The Famous Spreader-Flame Gas Boiler

The Gordoneer



A.G.A. APPROVED



This gas-fired hot water wet-base boiler, with lifetime cast iron, ushers in a new standard in home heating efficiency, economy, and service.

COSTS LESS TO BUY... TO INSTALL.. TO OPERATE!

"The GORDONEER" is fired by "The Standard of the Industry" . . . the patented GORDON Spreader-Flame Gas Burner!

The GORDONEER sectional cast iron boiler is designed and constructed on a unique principle—SELF CLEANING WATER TUBES and BAFFLES are cast in each section—gives you . . .

MAXIMUM HEATING SURFACE + LONG, INTIMATE FLUE GAS TRAVEL = MORE HEAT PER FUEL DOLLAR

A New Concept of Peak Heating and Lifetime Heating Economy!

For new homes or apartments or for modernization where space is at a premium.

Also ask our nation-wide representatives about ROBERTS-GORDON Furnaces, Conversion Burners, Unit Heaters. Write us for DESCRIPTIVE LITERATURE and the name of our representative for your territory—he'll show you how ROBERTS-GORDON products and promotion can mean MORE PROFITS to you!

SEE ROBERTS-GORDON BEFORE YOU SELL!



Manufacturers of Gas Heating Equipment for Over a Quarter of a Century
DEPT AA BUFFALO 6, N. Y.

appointments . . .

K. T. DAVIS as director of engineering and product development for Bryant Heater Div., Affiliated Gas Equipment, Inc. Mr. Davis will direct the development of heating and air conditioning equipment. Since 1952 he has been manager of the company's sales engineering department.



K. T. Davis



J. M. Morton

JOHN M. MORTON as assistant advertising manager of the Viking Air Conditioning Corp. Mr. Morton will assist in the preparation of technical publications, catalogs and consumer material.

CHARLES J. WOLFER as representative in the Houston area for The Gene Brown Co., manufacturers' agents handling the sale of incinerators, evaporative coolers, controls, and other equipment.

GERALD F. DEER as regional sales supervisor of the western division for "Winkler" heating equipment for U. S. Machine Div., Stewart-Warner Corp. Mr. Deer will work with 14 district sales managers in 12 central and midwestern states.



G. F. Deer



W. A. Cook

WILLIAM A. COOK as dealer sales manager and J. G. Calhoon as assistant sales manager for The Meyer Furnace Co. Mr. Cook has done sales and promotion work for Green Colonial Furnace Co. and Armstrong Furnace Co., and for the past three years has been co-owner of a wholesale heating business. Mr. Calhoon was previously in charge of sales promotion for Meyer Furnace Co.

FRANK DOHERTY as sales representative for the Washington, D. C., district of the Heil Co. Charles Kahl, Jr.,

**“... opportunity
is freely given ...”**

PAUL M. HAHN
President, The American Tobacco Co.



“Our nation has grown great largely because opportunity is freely given. Only very few people actually make their own ‘breaks.’ Today, millions of Americans are providing for their personal financial security and at the same time helping in the building of our national defenses. The opportunity to do so is given by business management which affords employees the means of practicing systematic thrift through the Payroll Savings Plan for the purchase of U.S. Defense Bonds.”

Nearly seven million employees of industry are “providing for their personal security and at the same time helping in the building of our national defenses.”

- they are the men and women who availed themselves of the opportunity referred to by Mr. Hahn—the opportunity to enroll in the Payroll Savings Plan for the systematic purchase of U.S. Defense Bonds.
- they represent a high percentage of their companies’ employees—in plant after plant, the averages are climbing to 60%, 70%, 80%—even higher.
- their investment in Defense Bonds—and America—add up to \$140 million per month.
- they constitute a large block of the men and women who on December 31, 1951, held Series E Bonds

amounting to \$34,727,000,000—\$4.8 billions more than the cash value of Series E’s outstanding in August, 1945.

Not far from you is a State Director of the Savings Bond Division. He will be glad to tell you how easy it is to give your employees a Payroll Savings Plan. Or, if you already offer the Plan to your people, he will show you how to conduct a simple person-to-person canvass of your plant—a canvass intended to do only one thing—to put a Payroll Savings Application Blank in the hands of every man and woman on your payroll. Your employees will do the rest.

Phone or write to Savings Bond Division, U.S. Treasury Department, Suite 700, Washington Building, Washington, D. C.

The U. S. Government does not pay for this advertising. The Treasury Department thanks, for their patriotic donation, the Advertising Council and

AMERICAN ARTISAN



THIS IS IT!

LAY OUT ANY PATTERN IN A FEW MINUTES WITH THE NEW JET PATTERN DEVELOPER

SAVES

TIME
MATERIAL
LABOR
SPACE

MONEY



ONLY

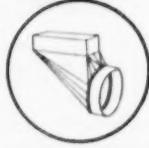
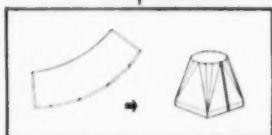
\$69⁵⁰

COMPLETE
WITH 30
TEMPLATES

With the Jet Pattern Developer any mechanic can quickly and easily layout Square to rounds, Cones, Elbows, Intersections, Wye Branches, Register Booths, Dormers (any pitch), Transitions, Three piece transitional elbows round to square and thousands of other complex patterns. In fact we haven't found a pattern yet that can't be laid out in a few minutes time with this amazing new tool.



Simply attach templates, adjust for any pitch or offset and roll out your complete pattern. That's all there is to it.



Eliminates triangulation and radial lines, trimming, waste, large pattern stocks, and hours of time. You will save the entire cost of your JET PATTERN DEVELOPER in less than a week.

16 MM sound film available to groups

H. OWENS COMPANY

9300 Venice Blvd., Culver City, California

Please send _____ Jet Pattern Developer(s) @ \$69.50 each.

- ☐ Full amount enclosed send Postpaid
- ☐ Send C.O.D. I will pay postage
- ☐ Send more information

NAME _____

ADDRESS _____

CITY _____ STATE _____

10 Day Money Back Guarantee—Please include state tax

appointments . . .

has joined the Union, N. J., district office, and will service heating accounts in New Jersey, Connecticut, Rhode Island, Massachusetts, New Hampshire, Vermont, Maine, eastern New York and eastern Pennsylvania.

MARC RESEK as vice president in charge of research for Perfection Stove Co. This position will include market research, research for new and current products, and research involving contract items. W. H. Haag, previously head of the manufacturing and purchasing divisions, has been named vice president of manufacturing, engineering and purchasing. W. M. Day, formerly chief engineer, will be in charge of the engineering department.



Marc Resek



W. H. Haag



W. M. Day

H. V. STEHL as vice president and general sales manager for Inland Steel Products Co. Mr. Stehl replaces W. A. Jahn, who recently became president of the company. He will also assume the duties of general sales manager formerly handled by Robert S. Schmieder, who has retired. Gordon Matthews and Michael P. Komar were named assistant general sales managers.

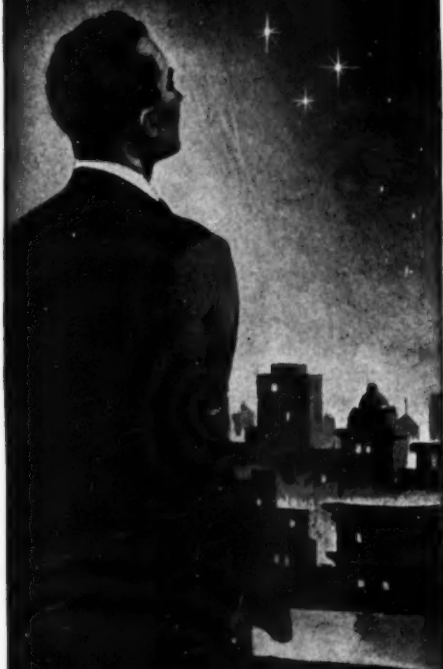
THE FOUR BRANCH offices of Clowe & Cowan, Inc. (at Roswell, N. M.; Amarillo, Lubbock, and Wichita Falls, Texas) as distributors for The Hammel Radiator Engineering Co., manufacturers of wall furnaces.

TODD-FORD LTD., as distributor for the Air Conditioning Div., Servel, Inc., in the San Antonio, Texas area. Keith Carpenter, Denver, has been named a retail sales development representative.

J. A. CURRIE as representative covering the Chicago Metropolitan district for Dryomatic Corp. N. L. Pearson will cover the remainder of the state of Illinois. R. C. Schneider will handle the state of Wisconsin. O. R. Kreutziger and Warren Kjildsen of the K & K Sales Co., will cover Minnesota, Iowa, and North and South Dakota.

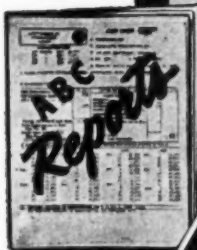
RALPH G. COX as district manager of the southeastern region for the Fiber Glass Div., Libbey-Owens-Ford Glass Co., with offices at Charlotte, N. C. Five distributors for fiber glass have been appointed. They are: Moncrief-Lenoir Mfg. Co., 2103 Lyons Ave., Houston, with branch warehouses in Dallas, Fort Worth,

Oh! **WHERE**... *is my wandering ad tonight?*



SEND THE RIGHT MESSAGE TO THE RIGHT PEOPLE

Paid subscriptions and renewals, as defined by A.B.C. standards, indicate an audience that has responded to a publication's editorial appeal. With the interests of readers thus identified, it becomes possible to reach specialized groups effectively with specialized advertising appeals.



THERE are two ways to buy advertising space. One is the guesswork-opinion method. The caption above is the mournful song of an advertiser who is still selecting media the way it was done before World War I, when there were no standards for the circulations of published media and when there was no accepted and approved method of auditing circulations. In those days, advertisers O.K.'d their proofs and sent out their advertising with a prayer that some of their sales messages would find their way to market.

The other way to buy space is the factual, know-what-you-get-for-your-money method. Today advertisers can start their investments on a basis of facts by selecting media with the help of the information in the reports issued by the AUDIT BUREAU OF CIRCULATIONS. This cooperative and nonprofit association of 3300 advertisers, advertising agencies and publishers, organized in 1914, has established standards that make it possible to evaluate the circulations of published media. The A.B.C. maintains a large staff of experienced and specially trained circulation auditors who make annual audits of the circulations of publisher members. A.B.C. reports give the facts thus obtained.

Here are some of the audited facts about business papers that A.B.C. reports tell the advertiser:

- how much paid circulation;
- how much unpaid;
- an occupational or business breakdown of subscribers;
- where they are located;
- how much subscribers pay;
- whether or not premiums are used;
- how many subscribers are in arrears;
- what percentage of subscriptions are renewed.

Those who buy advertising on the basis of this factual information, as given in A.B.C. reports, do not have to speculate about the distribution of their sales messages. They **KNOW** where and to whom their advertising goes. That is why this business paper is a member of the AUDIT BUREAU OF CIRCULATIONS. Ask for a copy of our A.B.C. report and then study it.

American Artisan

A. B. C. REPORTS—FACTS AS THE BASIC MEASURE OF ADVERTISING VALUE



Steel PRESS BRAKES

Many Standard Sizes
Latest Designs
and Features
for Fast Accurate Work.

Complete line of
induction hardened
forming dies for all
makes of press brakes.



All sizes of CHICAGO press brakes are readily adapted for a wide variety of bending, forming, drawing, notching, blanking, punching, embossing, etc.

Full Particulars and Recommendations for Any Job upon Request

DREIS & KRUMP
MANUFACTURING COMPANY

7404 S. Loomis Blvd., Chicago 36, Illinois



Mr. Dealer:

We want to send to you our catalog and price list.

You will then realize why Bard Dealers make more money with our complete line than with any other.

It's a known fact that Bard's Multi-Radiator construction gives top performance and fuel economy.

That's why sales are easier—with satisfied customers. Mail a card or letter today. You will profit more.

Bard Manufacturing Co.
BRYAN, OHIO

appointments . . .

Harlingen, Lubbock, San Antonio, Temple and Houston; Midland Engineering Co., 1501 Kentucky Ave., Indianapolis, to cover part of Indiana and seven counties in Illinois; Dodge Engineering Co., 14731 E. Seven Mile Rd., Detroit, to handle sales in parts of Michigan; D. M. Peffley & Con, Inc., 301 Valley St., Dayton, to cover 11 Ohio and three Indiana counties; and R. L. Moore Pipe & Boiler Covering, 117 E. Morgan St., Raleigh, N. C., to serve 37 counties in the Raleigh area.

HAL BALES as sales representative in North and South Carolina for Jackson and Church Co. He will handle the company's complete line of furnaces.



Hal Bales



W. G. Harkness

W. G. HARKNESS as sales representative for the Norris Blanchard Co. of Omaha, manufacturers' representatives

BEVERLY THROATLESS SHEARS



18 ga. metal
cut with
Model B-1
Shear.

MAKE CUTS LIKE THESE
QUICKLY...
EASILY... ACCURATELY

Save time, labor and material—use a Beverly to make any cut... straight, curved or irregular in any metal. Exclusive design allows work to be turned at any angle while cutting. Standard in the industry for years. 4 models—capacities to 1/2" mild. See your Beverly Distributor for a demonstration. Write for FREE illustrated circular on Beverly metal cutting Shears.



MODEL
B-3
with ball
bearing
hold down.
Cap. 1/2"
mild; 10
gauge
stainless.

Beverly SHEAR MFG. CO.

3020 W. 111th STREET • CHICAGO 43, ILLINOIS

SPLICE GUTTERS WATER TIGHT FAST ...

EASY ...

With



MELAWAY COUPLINGS

Adjustable for 4-5-6" half round gutter.

Will align gutter and square miters. Gutters may be joined at the eve as easily as on the ground.

Prevents expansion damage to gutter. The only satisfactory method for repairing gutter. Applicator guaranteed.



Write MELAWAY CORPORATION

BRANDON, WIS.

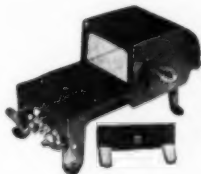
PHONE 1361

MORE HEAT FOR YOUR DOLLAR WITH JOHNSON BENCH SOLDERING FURNACES

1800°F. without forced air blast.

No. 101 Bench Furnace

The most efficient, powerful and economical bench furnace made for heating soldering coppers up to 12 lbs. per pair. Also used for heat treating, case hardening, and annealing carbon steels. Two burners. Firebox $3\frac{1}{4} \times 4\frac{1}{2} \times 5\frac{1}{2}$. Complete with work rest block and baffle plate. \$18.80 F.O.B. factory.



No. 118 Combination Bench Furnace

For heating largest soldering coppers, stenciling irons, branding irons, etc.; heat treating carbon steels, and soft metal melting. Lid on hood is removable for inserting 22 lb. pot for melting lead, tin, babbitt, etc. Three burners. Firebox $6\frac{1}{4} \times 5 \times 6\frac{1}{2}$. Complete with pot. \$35.00 F.O.B. factory.

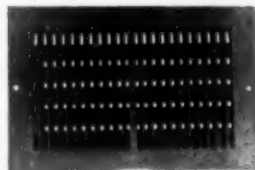


**WRITE FOR FREE
LITERATURE**

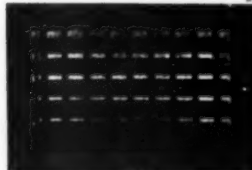
JOHNSON GAS APPLIANCE CO.

580 E AVENUE N.W. CEDAR RAPIDS, IOWA

See Your Jobber

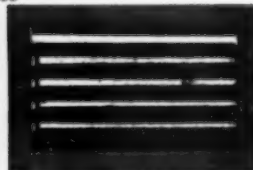


2300



2200

Many thousands of the above types used in housing projects. Lowest in price, more free area.



2100

The Air-O-Vane ceiling diffuser. Also made in type D-R with positive shut-off control (Patents Pending) made in all sizes.



Greatest in free area of any ceiling diffuser and lowest in cost. Write for catalogue or see your jobber.

AIR-O-VANE CEILING DIFFUSER
WRITE FOR CATALOGUE TO —



KRUEGER
AIR CONDITIONING COMPANY

19 EAST RILLITO ST. TUCSON, ARIZONA

"Made-Rite" fittings Save job TIME!



One sure way to KEEP down job time is to check on assembly time for warm and cold air runs. If your figures prove it excessive, then it's time to check with us. We can offer you a superior line of furnace fittings which will cut installation time to a minimum, and free your help for more jobs in less time.

We're equipped, too, for reeling, and slitting and shearing metals 14 gauge or lighter and up to 36" wide. Prices quoted on receipt of your specifications

"Made-Rite" Co., Inc.

Manufacturers & Suppliers
Furnaces — Pipe and Fittings

10th and Monroe St.

Newport, Ky.



The Swing's to

ANCHOR
OIL BURNER

**FOR THE FINEST IN
OIL HEATING EQUIPMENT**



Smart dealers everywhere are joining the Anchor line-up. They know that Anchor makes the very best in quality oil heating equipment. Anchor's Shell Combustion Head affords far greater efficiency than ordinary heads. Every single tiny oil droplet is completely consumed. These dealers know, too, that Anchor offers a franchise that tops them all. There's an Anchor conversion burner or oil-fired furnace for every installation. Why don't you get on the Anchor team? Get full details today.

88th Year of Manufacturing the Best in Mid-West!

ANCHOR
DIVISION

STRATTON & TERSTEGGE CO., INC.

P. O. Box 311 • New Albany, Indiana

**SUBSTANTIAL
PROFITS
for YOU—**

*Cleaning Furnaces
with the*
**GRAND RAPIDS
De Luxe
FURNACE
CLEANER**



You can put furnace cleaning on a money making basis by using a Grand Rapids Furnace Cleaner. High velocity suction scoops up all deposits of soot, ashes and carbon, cleaning the heating plant and re-establishing full efficiency. Special attachments clean flues, radiators, right angle turns and other hard-to-reach areas. The job is done quickly and completely. Customers are highly satisfied.

The Grand Rapids De Luxe Furnace Cleaner is also your "in" for more than cleaning profits. By checking over and inspecting the heating plant as you clean it you are in a position to make timely recommendations for new equipment or repairs. This means better service for customers . . . more profits for you.

Write for complete
information and prices today.



DOYLE VACUUM CLEANER CO.

227 Stevens St., S.W.

Grand Rapids 7, Michigan

appointments . . .

and distributors handling wall heaters, wall furnaces, oil and gas controls, and blowers and ventilating fans.

JURG A. SENN as manager of the new diaphragm power element division of The Paragon Electric Co.



J. A. Senn



R. M. Taylor

RALPH M. TAYLOR as field sales representative for General Controls Co. in the Los Angeles area. Mr. Taylor was formerly with the Payne Furnace Div., Affiliated Gas Equipment, Inc.

CLOYD C. WEAVER as sales engineer in the eastern Ohio territory and Adrian R. Mavis as sales representative in Kentucky and southern Ohio for International Heater Co. Mr. Weaver was formerly president of the

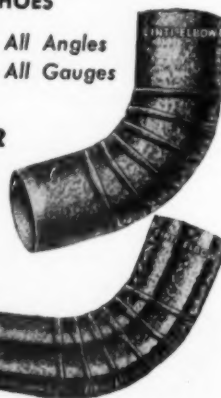


**OUR
ELBOWS
HAVE
PERFECT
FORM**

**CONDUCTOR PIPE ELBOWS
AND SHOES**

- All Sizes • All Angles
- All Metals • All Gauges

**SEE YOUR
JOBBER**



**The CINCINNATI
ELBOW CO.**

2021 EASTERN AVE.
CINCINNATI 2, OHIO

200 Experienced Oil Burner Men

... will become oil heating specialists in the next 12 months. This is the maximum number of men who will be accepted for, (and will receive their certificate of completion from), the course offered by the Boston School of Advanced Oil Heat Training. Classes are limited to 10 men only — the course is three days.

You need this course if you are not thoroughly qualified in the following phases of perfect pressure atomizing burner installation:

1. How to correctly determine the firing rate for any boiler or furnace.
2. Combustion Chamber construction, large and small sizes, proper areas, materials, heights and correct design under special conditions.
3. Baffling of boilers and furnaces; importance of baffling; proper type and location.
4. Draft Control — importance of holding a constant draft, location and setting of control.
5. Mating of Air and Oil Patterns — one of the greatest developments in modern oil heating efficiency.
6. Nozzle Application Testing in the field — how you can determine the right nozzle for any installation.

If you need this knowledge to qualify as an oil heating specialist and this school is the only one in the world offering such a course, you must have had one or more years of installation and service experience to be acceptable for enrollment.

Write for circular, schedule of classes, complete information

**BOSTON SCHOOL of ADVANCED
OIL HEAT TRAINING, Inc.**

7 Willow Street, Lynn, Massachusetts



*Throughout the
AIR CONDITIONING
Industry—*

**AEROFIN FIN-TYPE
HEAT-TRANSFER UNITS**
do the job Better,
Faster, Cheaper

AEROFIN CORPORATION
410 South Geddes St., Syracuse 1, N. Y.



SALES ARE ZOOMING!

BABY-SAFE
Circulaire
RECESSED WALL HEATERS

**MORE SALES MEAN
MORE
DEALER
PROFIT**

8 SIZES—15,000 to 60,000 BTU—Most complete line available—Get the facts and you will handle CIRCULAIRE too.

WRITE OR CALL



Convert Gravity Furnaces With A CIRCULATAIRE Bonnet Blower



CIRCULATAIRE ELIMINATES COLD ROOMS,
BALANCES HEAT DISTRIBUTION, SAVES FUEL

CIRCULATAIRE solves the problem of "hard to heat" rooms, boosts warm air quickly through all the heating pipes. CIRCULATAIRE is easily and quickly installed without removing the bonnet. Packaged unit includes motor and fan control. No new sheet metal work required, no changing of cold or warm air pipes, no baffles to be built. The CIRCULATAIRE is rigid, quiet and efficient in operation.

NOW READY—New CIRCULATAIRE Sales Aids add effectiveness to selling interview, conserves valuable selling time and increases sales.

A COMPLETELY PACKAGED UNIT
Nothing for the dealer to furnish except limited amount of labor.



GET THE FACTS TODAY! WRITE...

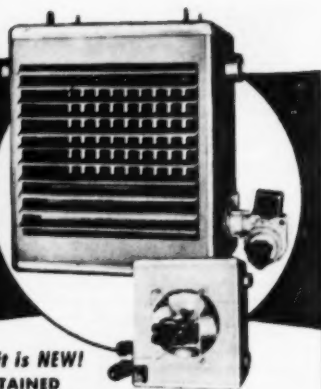
CIRCULATAIRE DIVISION OF CORLETT-TURNER CO.
1001 S. KOSTNER AVE., CHICAGO 74

A SPECTACULAR
ADVANCEMENT
IN HEATING!

A DIRECT-FIRED

OIL UNIT HEATER

by *Delta*



Everything about it is NEW!

- **COMPLETELY SELF-CONTAINED**
No boilers, chimneys, traps or pumps.
- **TREMENDOUS HEATING EFFICIENCY**—Output 220,000 BTU/hr. Immediate warmup.
- **HEAT ONLY WHERE IT'S NEEDED**—Adjustable louvers to direct heat where needed. No heat wasted on walls or ceilings.
- **HEAT ONLY WHEN IT'S NEEDED**—Thermostat controlled. Can be switched on and off when necessary. No overheating.
- **EXTREMELY ADAPTABLE**—Units are easily moved around to meet plant changes.
- **AIR CIRCULATION & VENTILATION**—Heater becomes an effective summer air circulator and ventilator.
- **SPACE-MISER**—Suspends overhead. Base mounted on dolly for portable spot heating.
- **LOW OPERATING COSTS**—Gun-Burner uses inexpensive fuel oil and eliminates costly fuel waste.
- **MONEY-SAVING INSTALLATION**—Quick and easy. Factory assembled and wired—less labor, time, and material needed.

Inexpensively ideal for

FACTORIES • WAREHOUSES—STORES • RESTAURANTS • LOBBIES
OFFICES • COMMERCIAL BUILDINGS

WRITE, WIRE, PHONE NOW for more details!

DELTA HEATING CORPORATION TRENTON 8, NEW JERSEY

YOUR BEST INVESTMENT LEVER **WHITNEY** PUNCHES

GOOD TOOLS
HELP YOUR
MECHANICS
DO BETTER
WORK . . .

AND YOU
CAN'T BUY
BETTER TOOLS
THAN OURS!



NO. 6

Skylight, Ventilating and
Tank Flange

Punch (Especially adapted
for button punching)

Capacity 1/4" hole through
3/16" iron

Length 26 1/2". Wt. 10 1/2
lbs. Depth of throat
1 3/4"

Punches and dies 1/8" to
9/32" by 1/32"

Please Write
Today For
Literature

See Your Jobber.



WHITNEY MFG. CO.
636 RACE ST. ROCKFORD, ILL.

appointments . . .

Weaver Coal & Supply Co. Mr. Mavis has 10 years of heating experience as an installation and service man.

GEORGE J. FINCK as district manager of the New York sales office for Bush Mfg. Co. and Heat-X-Changer Co. Edgar L. Disbrow, Hugo Basch and Arthur H. Randall have also joined the New York district sales force.



G. J. Finck



R. N. Ruecker

RICHARD N. RUECKER as district manager for the Duo-Therm Div., Motor Wheel Corp. His territory will include the states of Arizona, Colorado, New Mexico and Utah as well as portions of six other southwestern states.

THE R. D. LITTLE Co., Minneapolis, as representative in North Dakota, Minnesota and western Wisconsin for

YOU
CAN COUNT ON

CLIPPER VENTILATORS
TO GIVE
TOP PERFORMANCE!



This is a fact—the exclusive Trade-Wind design, incorporating genuine centrifugal blower wheels, produces 25% more CFM at the end of the duct! This is where it counts after the installation has been made.

You can count on Trade-Wind to satisfy customers.

5717 SO. MAIN ST., LOS ANGELES 37, CALIF.



**for BETTER
PRODUCTION and
MAINTENANCE
at Lower Cost**

A proved time-saver in any sized shop. Libert's *flexibility* gives you a wider variety of work—clean shearing of flat or formed sheet metal... straight or irregular shapes... inside or outside cuts. Libert *simplicity* means that even unskilled labor soon does accurate work, lots of it *and fast!* Write for Bulletin.

Made in sizes up to 60 in. throat, 10 gauge capacity

LIBERT MACHINE CO., GREEN BAY, WIS.

Libert *Hi-Speed* SHEAR

KENT

**Double Suction
FURNACE CLEANER**

You can't make profits without performance — and that's where KENT shines! Two fans mean high vacuum, high air movement... low RPM of motor means long life. No outside dustbag, no dust passes through fans... low center of gravity, less chance of tipping. Convince yourself: it pays to buy a good tool!

**Don't decide till you
see the KENT!**



Carries easily — base weighs only 39 pounds, dirt can only 24 pounds!

Full information upon request

CLEAN WITH KENT EQUIPMENT

The KENT Company, Inc. • 435 Canal St. • Rome, N. Y.



Standard in the field for nearly 40 years. THARCO stays put! — No shrinking, cracking or checking. Now available in either black or light gray in 1-pound cans to 350-pound drums. Order from your jobber.



The ARMSTRONG COMPANY

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Detroit 17, Michigan

BARTH USA

ENGINEERING • RESEARCH DEVELOPMENT
DESIGN AND MANUFACTURING

Barth products include:

- Squaring Shears
- Slitting Shears
- Hand Brakes
- Slip Roll Formers
- Bar Folders
- Groovers



**A "Must" for Any Shop...
Barth Crimpers and Beaders**

Available in two models to handle 20 and 24 gauge materials. Heavier model (illustrated) can be converted to direct drive when used as independent crimper. Both machines may be adjusted to give shallow or deep crimp as desired. Regular equipment includes crimping, ogee beading rolls, plain collars, gauge, wrench and bench standard.

REQUEST FREE ILLUSTRATED BULLETINS ON BARTH PRODUCTS.
DISTRIBUTORS OF CONNECTICUT BRAKES.

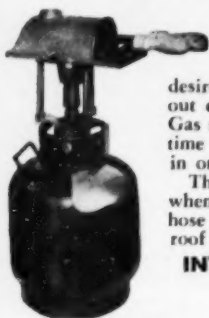
BARTH ENGINEERING and MANUFACTURING CO., INC.
MILDALE • CONNECTICUT • U.S.A.

**INSTANT
LIGHTING**

Insto-Gas

T.M. REG. U.S. PAT. OFF.

SOLDERING IRON HEATER



Sheet metal contractors can now have hot soldering irons in 2 minutes and with Insto-Gas they can be kept at the desired temperature all day long without even looking at the heater. Insto-Gas saves 40% on fuel cost and enough time to pay for the entire equipment in one week's operation.

The Insto-Gas soldering iron heater when attached to the cylinder by 50-ft hose can be operated on a scaffold or roof without moving the cylinder.

INTERNALLY FIRED SOLDERING IRONS

These Insto-Gas soldering irons are designed for continuous operation with no stopping to change irons. Made in two sizes; the No 1-S (2) for fine work and the No 2-S (5) for heavy soldering.

Listed by Underwriters Laboratories and Factory Mutuals Laboratories

Write For Free Folder
INSTO-GAS CORPORATION
DETROIT 7, MICHIGAN



appointments . . .

Trade-Wind Motorfans, Inc. Southern Agencies, Inc., Niles, Ohio, will extend representation into 16 counties of western Tennessee.



F. W. Boone



D. Barnstable

FRANK W. BOONE as sales specialist for the Amer-glas Div., American Air Filter Co., Inc. Mr. Boone will cover the entire country, handling special sales problems of original equipment manufacturers and distributors. Dale Barnstable has been appointed to the division's sales staff. He will cover the southern and eastern states, and will headquarter in the main office in Louisville.

D. H. FELIX as sales engineer for the Chicago office of Dravo Corp., handling the sale of warm air space heaters. E. G. Counselman has joined the New York office as

ADJUSTABLE PIPE SNOW GUARDS



"FITRITE"
3 PIPES,
3/4" I.P.S.
For all
types
of steep
roofs



"PROTECTOR"
2 PIPES,
1/2" I.P.S.
For smaller
roofs, new
or old

"FITRITE" SKYLIGHT GEARING



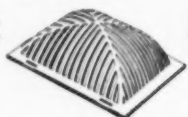
3/4", 1/2", 1"
Hook or chain
operation
Gearing
assembled
20" pipe on

"FITRITE" ROOF STRAINERS

Bronze and Aluminum



BEEHIVE
3"-8" round.
Also 3" x 4",
4" x 5"
square



3 Types
6", 8", 10",
12" square

"FITRITE" 3-WAY CLAMP



Throat 3 1/2" deep Jaws 3 1/2" x 3/4"

A necessary tool for every sheet metal man. Use it for on-the-job bending, forming, straightening and seaming. Price \$3.55

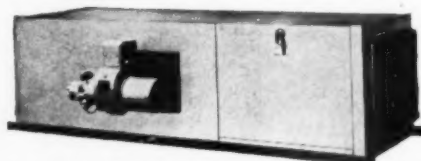
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NEW YORK, N. Y.
TELEPHONE: CHRYSLER 1-2400-2401

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CATALOG
in
SWEET'S TOOL
AND DIE
MANUFACTURER

**QUIET AUTOMATIC
OIL FURNACES**

SUSPENDED
Or Laydown Air Conditioning
FURNACES



SPACE SAVER...and a Labor Saver

It comes completely assembled including combustion chamber. For Garages, Service Stations, and Basementless Homes. Made in sizes from 75,000 BTU to 600,000 BTU.

Approved by Leading Oil Companies, Underwriters and Municipalities. WRITE TODAY FOR FULL DETAILS

A PRODUCT OF
QUIET AUTOMATIC BURNER CORP.

J. G. KAVENT, President

33-35 BLOOMFIELD AVE.

NEWARK 4, N. J.



To take the work out of installing linings for stoker hearth or combustion chambers — try Fire-Hearth! Just mix this castable, self-hardening refractory material with water . . . pour into place . . . trowel smooth. That's all! Fire-Hearth forms a smooth *one-piece* lining. With a service limit of 1500°F., it's ideal for lining ordinary domestic and commercial stoker installations or combustion-chamber linings for domestic oil and gas burners which operate intermittently. Comes in 50- and 100-pound moisture-proof bags.

FIRELINE PLASTIC REFRACTORY . . . For higher-temperatures (up to 3000° F.) choose Fireline . . . best for permanently lining firepots and cast-iron furnaces.

FIRELINE STOVE & FURNACE LINING CO.

1816 Kingsbury Street, Chicago 14, Ill.

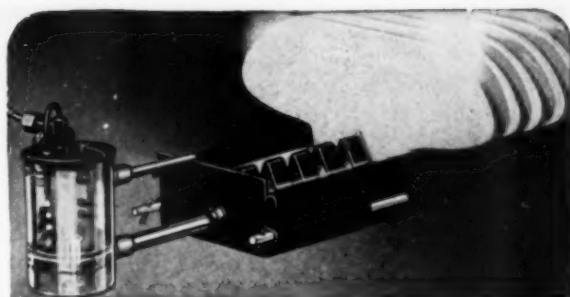
FITS like a Glove

Because it's a Galvan Elbow

At Your Jobber

- In All Sizes
- In All Gauges
- In All Metals

GALVAN
Manufacturing Co.
New Albany Indiana



A Lot of EXTRA PROFIT for a Few Minutes Work

• Set yourself a goal for the next three months. You'll be doing a lot of warm air jobs between now and December 1st — new construction and replacements. Make every one a Monmouth Humidifier job — installation while you are on the property takes little extra time yet is highly profitable — and you build customers for profitable year after year sales of new diffusion plates.

Made in capacities up to 420,000 B.T.U. All employ fast diffusion Monite plates and service-free, non-corroding, stainless steel and bronze Flotrol or Microfeed controls.

Descriptive literature, prices, discounts sent on request.

Cleveland Humidifier Co.

7802 Wade Park Avenue
Cleveland 3, Ohio

MONMOUTH HUMIDIFIERS

New COOK Blower Ventilators

Backwardly-inclined impeller, non-overloading



ROOF VENTILATOR in 9", 10", 12" and 14" sizes. Single phase, 110 V. 2-speed; 220 V. 1-speed; or 3 phase, 1-speed, Model BV.

ROOF VENTILATOR in 7", 9" and 10" sizes. Base fits 6" and 8" pipe. Handsome interior grille with this and above model, Model R.

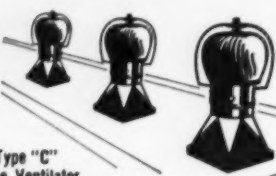
All models direct drive . . . damper optional.



Write for Catalog BV, Dept. AA, Loren Cook Co., Berea, Ohio.



**SIZES FOR EVERY
NEED IN STOCK
CONSTANTLY!**



Allen Type "C"
Turbine Ventilator

WIND-DRIVEN

Allen TURBINE VENTILATORS

Additional facilities (to keep pace with demand we've greatly increased our space!) now enable us to manufacture Allen Turbine Ventilators in a separate plant. This means that many of these accurately rated, highly regarded ventilators are in stock, in copper as well as coated iron, ready for immediate delivery, in throat diameters, 6 to 48 inches. Another type, motor-equipped Electro-Wind Turbine Ventilator, can be supplied for use in areas where wind velocities are not always sufficient. When roof ventilation is the answer to an air displacement problem, Allen ventilation can do the job—economically and performance-wise. Engineering assistance available. Our representatives are in most principal cities; names listed in our catalog in Sweet's Architectural File, Section 20b.

Write for catalog on complete
line of roof ventilators.



Roof Ventilators for Every Commercial and Industrial Need

**PRODUCTION
PLANNING CO.**
ROCHESTER, MICHIGAN



Save time and effort with expertly rolled Angle Rings that FIT Accurately on the job. Back them up together and you'll find each is a true circle with a 90° angle.

We roll rings to specification including tees, rounds, flats, channels, tubes and special shapes with or without rivet holes.

Used for many purposes such as reinforcing tanks, joining pipe or smoke stacks, and installing air conditioning fans. Write for our list of standard sizes and discounts — also our circular illustrating our fabricating services.

Phone Bishop 7-4255

NATIONAL METAL FABRICATORS

2140 So. Sawyer Ave.

Chicago 23, Ill.

appointments . . .

sales engineer covering the Metropolitan New York territory. He will handle the sale of counterflow heaters. John Schuster has been appointed to the Detroit offices, and will handle sales of counterflow heaters in the Michigan territory.

FRANK FIEDLER, Jr., as sales engineer for the Thermac Co., with headquarters in Los Angeles. Previously Mr. Fiedler was with the American Gas Association Los Angeles laboratories, where he served as test engineer and assistant manager.



F. Fiedler



H. S. Beagle

HOFFMAN S. BEAGLE as assistant to the president of Electrical Testing Laboratories, Inc. Previously Mr. Beagle was manager of the Heating Products Div., The Miller Co.

Copper - Brass - Bronze Perforated TO YOUR REQUIREMENTS

PERFORATED METALS
FOR ALL INDUSTRIAL USES
ARCHITECTURAL GRILLES
SEND FOR CATALOG #35

DIAMOND MFG. CO.

BOX 34

WYOMING, PA.

MILTON SHEET METAL MACHINERY SPECIALISTS

**STOCK DELIVERY ON PEXTO, CHICAGO
BRAKES, DIACRO, ROUSSELLE PRESSES, KIDDER,
WHITNEY, ROTEX PUNCHES, REX WELDERS**

**WE CARRY A COMPLETE STOCK OF NEW &
USED HAND & POWER MACHINERY.**

**WE STOCK PUNCHES & DIES & ADAPTERS FOR
ALL PRESSES & BRAKE DIES, SHEAR BLADES &
SPOT WELDER-TIPS & HAND TOOLS.**

MILTON EQUIPMENT COMPANY

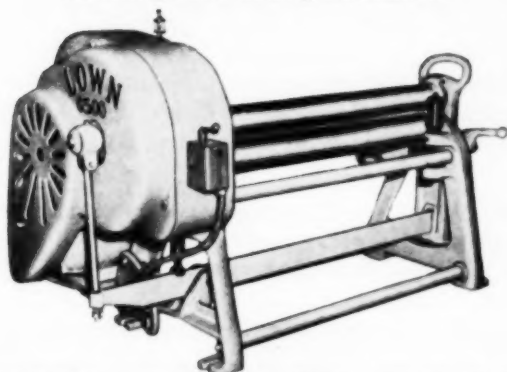
N.E. COR. 4th & Race St.

Phila. 6, Pa.

WALnut 2-1734

LOWN SLIP ROLL FORMING MACHINES

Model G-500
featuring Cone Rolling Attachment



Model G-550 Lown Slip Roll Former with 5" x 50" rolls, all power driven

A new improved modern design, engineered for durability, strength and service.

- Initial Pinch Type — Alemite Lubrication
- Capacity Model G-550, 8 - 10 gauge 4' wide. (Available in shorter or longer lengths)
- Quick Acting Latch on Drop Arm.
- Handwheel Adjustment of Rear Roll.
- Roll Position Indicators.
- Gear and Shaft Housing of rigid Unit construction.
- Fast, sturdy, easy to operate. Prompt Deliveries.
- Other machines with 2" to 9" dia. rolls also available.

Dealers in Principal Cities

Write for Bulletins—Mention this Ad

SAN ANGELO FOUNDRY & MACHINE COMPANY

1200 Park Ave.

Mt. Vernon, Illinois

TORCH-O-MATIC

FOR FASTER, EASIER SOLDERING
BRAZING—MELTING—



THE FULLY AUTOMATIC ON-OFF
AIR-ACETYLENE GAS GUN

Instant, one-hand operation saves time, gas, and eliminates open flame hazards when not in use. Just pull the trigger and the air-acetylene gas lights instantly, release and it's out! As simple as all that, and no "time-out" to light up and adjust. The Torch-o-matic gas gun pays for itself many times

over in savings and convenience. Three sizes of tubes and nozzles to take care of any job. Will fit your present equipment. Halide Leak Detector attachment locates the slightest refrigerant gas leak. Write for the details on how Torch-o-matic can speed your operations and cut down costs.

VELOCITY POWER TOOL COMPANY

201 North Braddock Avenue • Pittsburgh 8, Pa.

4 Real Reasons why 370 SPECIAL RED OXIDE PAINT

Can Cut Your Sheet Metal
Painting Costs

1. More coverage per gallon
2. Easy, fast application
3. One coat covers
4. Faster setting-up time

Yes, 370 Special can save you money. Users report it covers more than five squares per gallon . . . sets up in 4 or 5 hours. It pleases your customers because it *really protects* against corrosion. Also available in green, blue, gray, brown and aluminum. ORDER 370 SPECIAL NOW FROM YOUR DISTRIBUTOR, or write for complete details and prices.

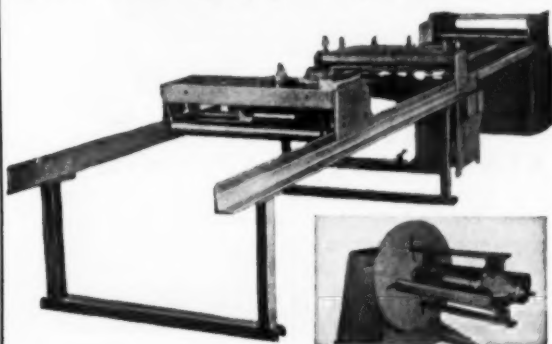


THOMPSON & COMPANY

1085 Allegheny Ave., Oakmont, Pa.

Established 1847

Modern De-Coiling Equipment by "DAHLSTROM"



Coiled materials are fed, straightened, measured, cut into sheets, and ejected on a continuous basis automatically. Line shown handles to 36" widths in 20 ga. mild steel—coil weights to 6000#. OTHER CAPACITIES AVAILABLE.

Inset shows self centering coil reel which is part of the complete line—Unit has infinitely variable speed drive between 35 and 100 fpm.

PURCHASE ALL YOUR MATERIALS IN COILED FORM AND ENJOY THE FOLLOWING ADVANTAGES:

- Lower material inventories
- Less Scrap (sheets can be cut to exact lengths needed)
- Material handling savings
- Tons more storage in the same space

DAHLSTROM MACHINE WORKS, INC.

4227 West Belmont Ave.

Chicago 41, Ill.

FLANGES THE DUCT

IN LESS THAN
5 SECONDS

Works like a bar-
folder with a new
twist.

Handling the
work back and
forth has been
eliminated by a
unique manipula-
tion of the bender
itself.

"Best
little tool
in the shop"



No money tied up in idle equipment . . . And no time wasted in making adjustments . . . Fits any size ducts up to width of bender and any thickness up to 20 gauge mild steel.

No. 12 SMITH'S CLEAT BENDERS (12" Wide) \$46.20*

No. 18 SMITH'S CLEAT BENDERS (18" Wide) \$72.60*

*Prices subject to change without notice)
FOB Waukegan, Illinois

R. E. SMITH

1806 BELVIDERE ST.

WAUKEGAN, ILL.



ORNAMENTS STAMPINGS & SPINNINGS

Zinc Ornaments Available From Stock. Copper, brass, bronze, aluminum and stainless steel ornaments made up promptly.

If you don't have catalog K, send for it NOW.

MILLER & DOING

89 ADAMS STREET

BROOKLYN, N. Y.

Hard to
SODER —
Metals

Galvanized Metals
Aluminum, Cast Iron
Stainless Steel



FLUXES

SODERING
BRAZING & WELDING

L. B. ALLEN CO. INC. Chicago 31, ILL.

6702 BRYN MAWR AVENUE, CHICAGO 31, ILL.

appointments . . .

THE HOWARD HALL CO., Milwaukee, as distributor in the state of Wisconsin for the Turb-O-Tube Furnace Co.

HERBERT A. FOWLER as manufacturers representative in the state of Maine for Sun-Ray Burner Mfg. Corp. Mr. Fowler's offices are at 10 Wescroft Rd., Reading, Mass.

EDWARD J. ALLARD, Swampscott, Mass., as manufacturers agent for the Nu-Way Corp. Mr. Allard will handle the sales of oil heating equipment in the New England states.

J. SICKLER as a member of the staff of Ashburn Supply Co. Mr. Sickler will assist Norris Sheffield in the order department.

MASSEY, WOOD & WEST, INC., Richmond, Va., as distributors of electronic air cleaners for the Sturtevant Div., Westinghouse Electric Corp.

NORMAN S. WRIGHT & Co. of San Francisco, Portland and Seattle, as manufacturer's representatives for the United States Air Conditioning Corp., handling heating, ventilating and air conditioning equipment.

Big Time and Money Savers for YOU!

LOCKFORMERS

- Cut Over-All Fabrication Costs in Half.
- Make Pittsburghs 15 Times as Fast as you Can Make them on a Hand Bending Brake.
- Pay for Themselves Quickly Out of the Extra Profits each one earns.

ALL MODELS IN STOCK FOR
IMMEDIATE DELIVERY!

Easy edgers and power flangers also available for immediate shipment.

- Send for illustrated folder and more information about this and other sheet metal working equipment.



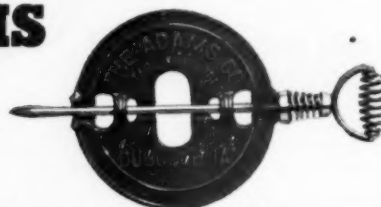
WARD MACHINERY CO.

161 W WASHINGTON BLVD.

CHICAGO 6, ILLINOIS

ADAMS

Sizes from
3 to 18 inches



Diamond Smoke Pipe Damper

Buy Adams Known Quality

THE ADAMS COMPANY

Bridge Street • Established 1883 • Dubuque, Iowa

The New
THOR

Two
in
One

UNIVERSAL CLIP PUNCH

Eliminates 50% or more of the labor previously involved in joining metal together without the use of rivets.

Used on Standing Seams, Government Locks, etc., it punches through 3 sheets of 20 ga. mild steel, flattens out the lug and solidly squeezes the metal together as if riveted, ALL IN ONE OPERATION.

See your local dealer or write for descriptive literature.

THOR TOOL AND DIE CO.
865 Estabrook St., San Leandro, Calif.



Model No. 300-2
Weight only 4 lbs.

MANUFACTURERS OF

FURNACE PIPE AND FITTINGS,

Prefabricated Ducts,

also conductor pipe, eaves trough, drip edge, rake strip, etc.

THOR METAL PRODUCTS CO., INC.
Box 118 Eastwood Station Syracuse, N. Y.



Kirk-Blum

...one piece
BLOW PIPE ELBOW
SAVES YOU MONEY

- HOODS
- BALL JOINTS
- FLOOR SWEEPS
- BLAST GATES
- STAMPED AND ROLLED ANGLE RINGS

Cheaper and stronger than the ordinary pieced elbow, KIRK & BLUM'S One-Piece Elbows are rolled into a tube, then crimped on an exclusive machine to form a super tight, rigid elbow. These and other blow pipe parts, made in production quantities, are superior, cost less than the ordinary kind. Made in light to heavy gauges, from 3-inch to 14-inch diameter. Write for literature and prices.



Ball Joints
Any Size

THE KIRK & BLUM MANUFACTURING CO.
3180 FORRER ST. • CINCINNATI 9, OHIO

✓ **Check your
needs . . .**

- ☐ Personnel
- ☐ Equipment Sales
- ☐ Equipment Needs
- ☐ Manufacturers Agents
- ☐ Lines, etc.

Whatever your needs in any of the above classifications . . . you can solve them quickly with a classified advertisement. The space rates are reasonable and results are quick. Closing date — the twentieth of the month preceding issue.

FOR PERFECT SOLDERING

and GREATER PROFITS

In less time use Rubyfluid, the fast acting easy-to-use soldering flux that wets out freely, properly conditions metal for a strong union. No objectionable or harmful fumes. See your jobber or write direct for special \$1.00 offer.

RUBY CHEMICAL CO.

74 S. McDowell St. Columbus 8, Ohio



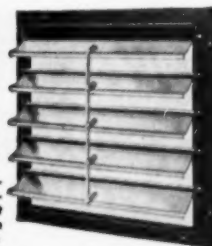
Rubyfluid

**Elgo Ventilating
Specialties**

**AUTOMATIC SHUTTERS
with ALUMINUM LOUVERS**

Because they are so light, the aluminum louvers are exceptionally sensitive to air currents, opening the instant the fan or blower starts. And when closed, they are exceptionally tight-fitting because every louver is weather-stripped. All sizes from 12" to 72" square — also rectangular.

Write for circular and prices.



"ELGO" TYPE
AUTOMATIC SHUTTER
Front View (Open)

**Free
CATALOG**

ELGO SHUTTER & MANUFACTURING CO.
2738 W. Warren Detroit 8, Mich.

BB
BLAST GATES



THESE BLAST GATES ARE DESIGNED FOR CLOSING OR PARTLY CLOSING PIPES SUPPLYING BLAST TO FURNACES, FORGES, BOILERS, Etc.; FOR USE IN EXHAUST OF BLAST PIPE SYSTEMS WHERE AIR IS TO BE REMOVED OR DIRECTED FROM ONE CHANNEL TO ANOTHER.

THE OPERATION IS SIMPLE BUT POSITIVE. SIMPLY PULL THE SLIDE BACK AND FORTH AS DESIRED. SLIDE CAN BE LOCKED IN ANY POSITION BY THUMB SCREW.

THE BODY OF THIS GATE IS CAST IRON, LACQUERED TO PREVENT RUSTING; THE SLIDE HEAVY STEEL.

MADE IN SIZES TO FIT PIPE 2 INCH TO 24 INCH INCLUSIVE.

WRITE FOR DATA SHEET.

SOLD THROUGH LEADING JOBBERS EVERYWHERE

Manufactured by
BERGER BROS. COMPANY
229-237 Arch Street Philadelphia 6, Pa.

Easy Flow
VENTILATORS



The Greenheck Industrial Turbine -- Outstanding in rugged construction -- No ventilation task too big -- Made in Sizes from 14 to 36".

GREENHECK BROS. MFG. COMPANY
SCHOFIELD WISCONSIN

BRAUER has
REPAIR PARTS for all FURNACES
BOILERS, STOVES • *Guaranteed to FIT*
A. G. BRAUER Supply Co.
2100 Washington Ave. St. Louis, Mo.

THERMO-VENT
Trade Mark Registered
AUTOMATIC AIR CONTROL
Controlled fresh air supply for heating unit—ventilation where it is needed—Simple to install in basement window or sill—Healthier living—70 degree temperature range—Closes automatically at lower temperatures—Sealed thermostat—Sturdy cast aluminum with screen—Treated with Iridite.



Every Home Needs One

Send for Illustrated folder.
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U.S. SECURITY BONDS
NOW!

for sale . . .

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. . . are you looking around for items or personnel to make your organization more efficient? A simple classified advertisement

in American Artisan will turn the trick for you quickly and at low cost.

agents wanted . . .

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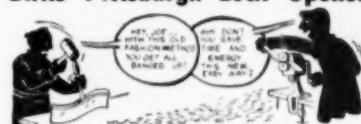
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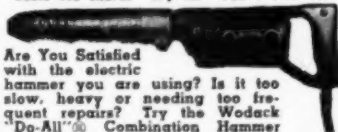
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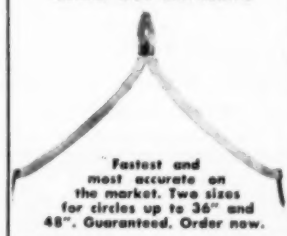
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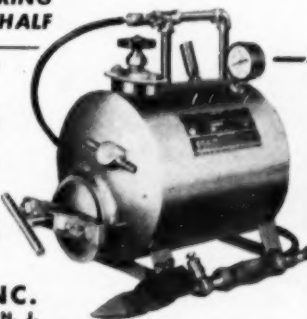
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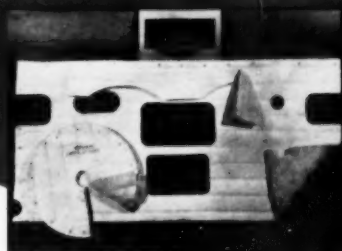
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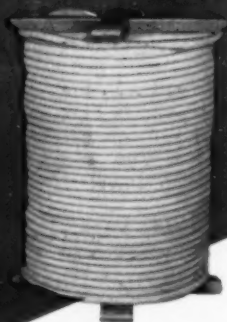


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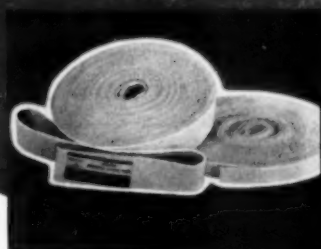
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